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EXHIBITING

A CONCISE VIEW

OF THE

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Corrigendum.

P. 49, lines 7 and 8, *for* synonymous with uterine irritation, *read* scarcely distinguished sufficiently from the symptoms of amaurosis arising from some other causes.

NOTICES TO CORRESPONDENTS.

Communications have been received from Dr HOLLAND, Dr BOYD, Dr HANDYSIDE, and Mr C. J. MILL, and Mr J. MASSEY.

The following Publications have been received:—

The Remote Cause of Epidemic Diseases. By John Parkin, Honorary and Corresponding Fellow of the Royal Academies of Medicine and Surgery in Madrid, Barcelona, and Cadiz, &c., Graduate of Medicine in the University of Erlangen, &c. &c. 8vo. Pp. 198. London, 1841.

Pathology, founded on the Natural System of Anatomy and Physiology; a Philosophical Sketch, in which the Natural Classification of Diseases, and the Distinction between Morbid and Curative Symptoms, afforded by pain or its absence, are pointed out, as well as the errors of Homoeopathy and other Hypotheses. By Alexander Walker, 2d edition, London, 1841. 8vo. Pp. 162.

Researches into the Causes, Nature, and Treatment of the more Prevalent Diseases of India, and of Warm Climates generally. By James Annesley, F. R. S. F. S. A., late President of the Medical Board of Madras. 2d Edition. London, 1841. 8vo. Pp. 606.

Memoire sur la Revulsion Morale dans le Traitement de la Folie. Par F. Leuret, Medecin en Chef a la l'Hospice de Bicetre, &c. Precedé du Rapport fait à l'Academie Royale de Medecine la 1er Juin 1841. Par M. M. Louis, Pariset, et Double. A Paris, 1841, 4to. Pp. 33.

A Concise and Practical Treatise on the principal Diseases of the Air-passages, Lungs, and Pleura. By Alfred Catherwood, M. D., C. M., &c. &c. London, 1841. 8vo, Pp. 208.

Spinal and Nervous Diseases, Rheumatism and Paralysis, or Cases and Observations illustrating an improved treatment. By John Hey Robertson, M. D., author of Spinal Diseases, with an improved plan of Cure. Glasgow, Edinburgh, London, 1842. 8vo, Pp. 119.

A Manual of General Therapeutics; with rules for prescribing, and a copious collection of formulæ. By D. Spillan, M. D., A. M., Fellow of the King and Queen's College of Physicians in Ireland. London, 1841. 12mo, Pp. 458.

An Inquiry into the Efficacy of Digitalis in the Treatment of Idiopathic Epilepsy. By Edmond Sharkey, A. B. M. D., One of the Lecturers on Midwifery at the Hunterian School of Medicine, Charlotte Street, Bloomsbury. London, 1841. 8vo, Pp. 80.

Guy's Hospital Reports, No. XIII. October 1841. Edited by George H. Barlow, M. A. and M. D., Trin. Col. Camb., &c. and James Babington, M. A., Trin. Col. Camb. London, 1841. 8vo, Pp. 235–452.

The Cyclopædia of Anatomy and Physiology. Edited by Robert B. Todd, M. D., F. R. S., &c. Part XXII. Marsupialia—Monotremata. Illustrated with numerous Engravings. London, November 1841. Large 8vo, Pp. 289–384.

A Treatise on the Nature, Causes, and Treatment of Erysipelas. By Thomas Nunnely, Lecturer on Anatomy, Physiology, and Pathology, in the Leeds School of Medicine, &c. &c. London, 1841. 8vo, Pp. 307.

Treatise on the Oleum Jecoris Aselli, or Cod Liver Oil, as a Therapeutic agent in certain forms of Gout, Rheumatism, and Scrofula. By John Hughes Bennett, M. D., &c. London, Edinburgh, and Dublin, 1841. 8vo, Pp. 150.

Elements of the General and Minute Anatomy of Man and the Mammalia, chiefly after original researches. By Fr. Gerber, Prosector in the University of Bern. To which are added Notes and an Appendix, comprising researches on the Anatomy of the Blood, Chyle, Lymph, Thymous Fluid, Tubercle, &c. By George Gulliver, F. R. S. Text and Appendix. 8vo. Pp. 390, and pp. 106. London. Paris. Leipsig. 1842. With Atlas, containing thirty-four Plates, engraved. Pp. 71.

Philosophical Nuts; or the Philosophy of Things, as developed from the study of the Philosophy of Words. By Edward Johnson, Esq., Author of "Life, Health, and Disease." London, Ipswich. No. 10. October 1841.

The Principles of Theory indispensable to sound observation in the Practice of Medicine: A Lecture introductory to a Course on Materia Medica. By William Seller, M. D., Fellow of the Royal College of Physicians, Edinburgh. Edinburgh, 1841. 8vo. Pp. 25.

Observations on the Analogy between Ophthalmia and other Diseases, being the substance of a paper read at King's College, London. By Charles Vines, M. R. C. S., Surgeon to the Reading Dispensary. London, 1841. 8vo. Pp. 32.

Memoir sur l'Etiologie Generale de Deviations Laterales de l'Epine par Retraction Musculaire Active. Lu à l'Acad. des Sciences, 23d Septembre 1839, 8ieme Memoire sur les difformités des systeme osseux. Par le Docteur Jules Guerin. Paris, 1840. 8vo. Pp. 31.

Memoire sur un cas de Luxation Traumatique de la Seconde Vertebre Cervicale, datant de sept mois et reduit par une methode particuliere, &c. La Neuvieme Memoir sur difformités, &c. Par le Docteur Jules Guerin, &c. Paris, 1840. Pp. 20.

Memoire sur l'Intervention de la Pression Atmospherique dans le mechanisme des exhalations sereuses, &c. &c. Lu 13 Janvier 1840. Par le Dr Jules Guerin. Paris, 1840. 8vo. Pp. 34.

Essais sur la Methode sous-cutanée comprenant deux Memoires sur les plaies sous-cutanées en generale et sur les plaies sous-cutanées des Articulations, &c. Par le Dr Jules Guerin. Paris, 1841. 8vo. Pp. 126.

Recherches sur les Luxations Congenitales, exposées dans les conferences Cliniques du 29 Janvier et du 3 Fevrier 1841, &c. Par le Dr Jules Guerin. Onzieme Memoire sur les difformités du systeme osseux. Paris, 1841. 8vo. Pp. 83.

Plan of Medical Reform and Reorganization of the Profession without subverting the erecting Colleges of Physic and Surgery, addressed to the Right Honourable Sir Robert Peel, Bart. By Richard Carmichael, M. R. I. A. Dublin, 1841. 8vo. Pp. 55.

Elements of Chemistry, including the most recent Discoveries and Applications of the Science to Medicine and Pharmacy, and to the Arts, illustrated by 236 wood-cuts. By Robert Kane, M. D. M. R. I. A. Dublin, 1841. 8vo. Pp. 1204.

Observations on Tuberculous Consumption; containing New Views on the Nature, Pathology, and Cure of that Disease; being an attempt to found its treatment on rational principles. Deduced from Physiology, and confirmed by extensive application. Illustrated by coloured Drawings. By J. S. Campbell, M. D., M. R. C. P. London, 1841. 8vo. Pp. 404.

Gazette Medicale de Paris. No. 38. Samedi, 18th September 1841. No. 50. Samedi, 11th December 1841.

L'Examinateur Medicale. No. 12. Dimanche, 19th Septembre 1841. No. 25. Dimanche, 12th December 1841.

The Medico-Chirurgical Review and Journal of Practical Medicine. No. 70. October 1841. Being No. 28 of a Decennial Series. Edited by James Johnson, M. D. and Henry J. Johnson, Esq. London, 1841. 8vo.

The British and Foreign Medical Review or Quarterly Journal of Practical Medicine and Surgery. Edited by John Forbes, M. D., F. R. S. &c. No. XXIV. October 1841. London.

The London Medical Gazette for the Session 1840–1841 New Series. No. 52, Sept. 17, 1841; No. 1, 24th Sept. 1841; No. 12, 11th Dec. 1841.

Comptes Rendus Hebdomadaires des Seances de l'Academie des Sciences, par MM. Les Secretaires Perpetuels. No. 3, 19 Julliet 1841; a No. 12, 20th Sept. et No. 16, 18th Oct.; No 18, 2d Nov. 1841; et No. 21, 22d Nov. 1841. Paris, 4to.

Pharmaceutical Transactions. Edited by Jacob Bell. No. iv. October; No. v. November; and No. vi. December 1841.

The Maryland Medical and Surgical Journal, and Official Organ of the Medical Department of the Army and Navy of the United States. Published under the auspices of the Medical and Surgical Faculty of Maryland. Baltimore, Vol. ii. No. 1. July 1841.

Weekly Tables of Mortality for the Metropolis, No. 36, 11th September

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PART I.

ORIGINAL COMMUNICATIONS.

ART. I.—*Additional Observations on the Static Lung Tests* By WILLIAM AUGUSTUS GUY, M. B. Cantab. Professor of Forensic Medicine, King's College, London; and one of the Physicians to the King's College Hospital.

IN a former number (No. 148) of the Edinburgh Medical and Surgical Journal, I examined the static lung tests by the aid of a larger number of observations than had previously been made available for that purpose, and I arrived at conclusions extremely unfavourable to the future employment of these tests in medico-legal inquiries. I now proceed to contrast the smaller groups of observations, collected by the several authors whose works I have laid under contribution, and to detail a few facts of interest which have come under my own notice. By this means some of the objections which lie against the conclusions contained in my former essay may be removed, and such statements as are well-founded may be confirmed. I shall treat the static lung tests in the same order as in the former essay, beginning with the absolute weight of the lungs.

The following table presents the highest, lowest, and average weight of the lungs of mature still-born children, and of children who survived their birth one month or less. The sex is either not stated, or the two sexes are thrown together.

TABLE XXX.

Name of Author.	No. of Obs.		Before Respiration.			After Respiration.		
	Before Resp.	After Resp.	Max.	Min.	Mean.	Max.	Min.	Mean.
Haartmann,	4	7	1534	1066	1257	1619	1023	1327
Jörg,	2	3	677	612	645	1133	766	945
Eisenstein and Zebitsch,	7	18	1185	369	812	1537	616	980
Schmitt,	36	27	1661	553	1056	2132	695	1271
Lécieux,	29	237	1636	340	773	2440	432	1048
Procès Verbal, &c.	5	13	1112	463	685	1514	476	976
Orfila,	5	5	586	448	528	1344	619	884
Devergie,*	5	2	1011	360	771	1262	1019	1140
Taylor,	5	4	687	586	645	774	562	676
Dr Guy,	3	3	1480	632	920	1178	510	805
Table I. and IV.	109	322	1661	340	874	2440	432	1072

A single glance at this table will show the great difference which exists between all the values derived from small groups of observations, the insufficiency of the data hitherto employed in discussing the value of the static lung tests, and the consequent necessity for a more extended induction. My former essay was intended to supply this want as far as existing materials would permit; the present essay may serve to show that the necessity for a larger number of observations has not been exaggerated. On a closer inspection of the table it will be seen that the maximum weight of the lungs of still-born children is, according to the observations of Schmitt, as high as 1661 grains, and according to Orfila, as low as 586; the former number being nearly three times as great as the latter. In like manner the smallest weight observed in four still-born children by Haartmann is 1066 grains; the smallest number recorded by Lécieux is 340; the former number being more than three times as great as the latter. The average numbers present, as might be expected, less disparity, but the highest number is more than twice as great as the lowest.

If we now examine the second column of the table, we discover differences of nearly the same amount. The column of maxima presents 2440 as the highest number, and 774 as the lowest; the former being more than three times as great as the latter. In the column of minima, the highest number is more than twice as great as the lowest, whilst the least average is little less than half the highest.

That these differences are entirely due to the small number of facts collected by the several authors, and not to any error of calculation, will at once appear if we compare the numbers in the several colmns. Thus, if 1661 appear too high a value for the lungs of a still-born child, the fact that Lécieux and Haartmann have recorded numbers as high as 1636 and 1534 respectively will at least lessen the improbability; and if these latter numbers, reduced from French and German weights, seem exaggerated, they receive strong confirmation from the highest number which has fallen under my own notice, viz. 1480. In like manner, the small number 586, (the maximum recorded by Orfila on his own authority), is to a certain extent confirmed by the low values obtained by Jörg and Mr Taylor. The same observations apply to the other columns. Hence it appears that the different values presented in the table are due solely to the cause now assigned,—the small number of facts from which they have been obtained.

---

* In the former essay, the maximum 1800 is given on the authority of Devergie. This is an error, the highest number observed by him in healthy lungs being 1011. In a case of œdema of the lungs the weight was 1537. The maximum before respiration, therefore, is on the authority of Schmitt, 1661.

A comparison of the weight of the lungs before and after respiration shows differences not less worthy of note between the values obtained by different observers. The maxima in the still-born, in more than one instance, fall but little short of the maxima in children who had lived one month or less, whilst in one case, the highest number in the still-born greatly exceeds the highest number in those born alive. This occurs in my own observations, which give 1480 before, and 1178 after, respiration. Again there are no less than three instances in which the minima in the still-born exceed the minima in those born alive. In one instance (that of my own observations) the average number before respiration exceeds the average after respiration by no less than 115 grains. In other instances, the difference, though on the other side, is extremely small. To show the total insufficiency of small numbers of facts, it will suffice to compare the observations of Mr Taylor with my own. The highest weight in five facts collected by Mr Taylor is 687 grains; the maximum of three observations of my own is 1480, or more than twice that number. Mr Taylor's average before respiration falls short of his average after respiration by 31 grains; my own average for the still-born exceeds the average in children born alive by no less than 115 grains.

These remarks have an important practical bearing. In a court of law, a medical witness may be asked for the result of his own experience—his personal experience—as to the weight of the lungs before and after respiration, and the consequent value of a given weight of lungs in an individual instance as a sign of live or still-birth. If this question were addressed in turn to each of the authors named in the table, how widely different would be their answers! If the word experience has any precise meaning, the numbers in the table represent that experience in the case of the several authors whose names are mentioned; and the answer which they must give to the question proposed is already expressed by the figures themselves. The decision of the majority would be, that the weight of the lungs is not much greater after respiration than before it; one author, at least, would be bound to represent the weight as nearly the same before and after respiration; and my own personal experience would be opposed to that of all the rest in representing the weight of the lungs before respiration as exceeding by a considerable fraction their weight after respiration. It appears, then, that no medical witness can be justified in laying any stress whatever on his own personal experience in questions of this kind; and that if his personal experience be appealed to, he is bound to guard against the errors to which it may lead by pointing out its utter insufficiency. When it is recollected that the table contrasts the weight of the lungs of still-born children with that of the lungs of children who have lived one month or less, and that the crime of infanticide is generally committed soon after birth, when the process of respiration has often barely commenced, and is extremely imperfect, it will be quite unnecessary to say more in condemnation of the absolute weight of the lungs, as a test of respiration. The personal experience of all observers, if it do not condemn the general statement, that the weight of the lungs is materially increased by respiration, will at least reject the application of the theory to individual cases, and for medico-legal purposes.

According to the general and loose statement of authors, the weight of the lungs before respiration is about one ounce, or 480 grains, and after respiration, two ounces, or 960 grains. It is always extremely difficult to determine on whose authority such general statements as these are put forth. The only author whose observations give any countenance to such an estimate is Orfila, whose averages are not very remote from the assumed weights before and after respiration; but if the much higher authority of Schmitt be taken as our guide, the weight before respiration will be nearly doubled, and that after respiration increased by little less than one-half. A mere inspection of the table will show how far this general estimate of authors is remote from the truth.

As this subject is one of too much importance to be dismissed so long as any means remain unemployed by which its true bearings may be ascertained, I have endeavoured still farther to test the value of the static lung tests by arranging the numbers before and after respiration in children at full term in two columns, and comparing them with each other. This comparison, as might be expected, shows that by far the majority of the numbers occurring in the still-born have their counterparts in observations made in children who have survived their birth. Thus, the numbers 1534, 1492, 1480, 1449, 1364, 1297, &c. occur both before and after respiration. In like manner, the numbers 494, 510, 541, 556, 571, &c. are met with both in the still-born, and in those born alive. Again, there are only eight observations on children who have survived their birth one month or less, in which the number exceeds 1661, the maximum before respiration; in other words, assuming 1661 to be the real maximum in the still-born, there are only eight instances on record in which we should have been justified in asserting from the weight of the lungs alone that the child had survived its birth; and if we limit the comparison to those who have lived one day or less, this number dwindles down to one. On the other hand, there are only three instances recorded, in which the weight of the lungs in the still-born fell short of their weight in those who survived their birth; or, in other words, only three cases in which, assuming 432 to be the real minimum after respiration, the weight of the lungs alone would have sufficed to decide the question of live or still-birth. It is impossible to place in a more striking light the utter inutility of the average absolute weight of the lung as a test of respiration.

I now proceed to examine the weight of the lungs compared with that of the body, or Ploucquet's test, and in doing so shall follow the same steps which I have already taken in discussing the value of the absolute weight of the lungs. The following table presents the values obtained from the observations collected by the several authors whose names are given. Here, as in the former table, no distinction of sex is made,—the observations on males and females being all thrown together:—

Table XXXI.

Name of Authors.	No. Obs.		Before Respiration.			After Respiration.		
	Bef.rn.	af.rn	Max.	Min.	Mean.	Max.	Min.	Mean.
Haartmann,	4	7	1 : 40	1 : 65	1 : 57	1 : 39	1 : 77	1 : 54
Jörg, .	2	3	1 : 61	1 : 64	1 : 62	1 : 39	1 : 64	1 : 49
Schmitt, .	36	28	1 : 34	1 : 81	1 : 58	1 : 23	1 : 78	1 : 43
Lécieux .	29	237	1 : 24	1 : 176	1 : 65	1 : 19	1 : 132	1 : 37
Procès Verbal, &c.	5	13	1 : 27	1 : 86	1 : 58	1 : 21	1 : 71	1 : 45
Orfila, .	5	5	1 : 50	1 : 99	1 : 72	1 : 32	1 : 53	1 : 44
Devergie, .	5	2	1 : 34	1 : 176	1 : 74	1 : 38	1 : 49	1 : 43
Taylor, .	5	4	1 : 49	1 : 91	1 : 63	1 : 41	1 : 82	1 : 53
Dr Guy, .	3	3	1 : 46	1 : 74	1 : 60	1 : 55	1 : 65	1 : 60
Table XX. XXIII.	96	314	1 : 24	1 : 176	1 : 57	1 : 19	1 : 132	1 : 38

This table, like the former one, places in a strong light the insufficiency of small numbers of facts, and of the personal experience founded upon them. The several values differ widely from one another; some giving nearly the same proportion before and after respiration, and others presenting a difference nearly as great as that laid down by Ploucquet, viz. 1 : 70 before respiration and

1 : 35 after respiration. The most marked differences exist in the observations of Lécieux, Orfila, and Dévergie; the remainder are much less considerable. The small group of facts collected by Haartmann gives nearly the same values before and after respiration, and the same remark applies to the results of my own observations. The average values obtained from Mr Taylor's facts and from my own are worthy of notice, and of comparison with the numbers in the first table. On referring to this table it will be seen that the average weight of the lungs before and after respiration differs very slightly in Mr Taylor's observations, whilst in my own the weight of the lungs in the still-born infant greatly exceeds that of children born alive; but a reference to the last table shows that the proportion which the weight of the lungs bears to that of the body in Mr Taylor's observations is much less before than after respiration, and that in the case of my own observations the proportion is exactly the same. This circumstance is easily explained by the aid of a fact established in my former essay, viz. the greater weight of the body of the still-born infant. The average weight of the bodies of the five still-born infants examined by Mr Taylor greatly exceeds the average weight of the four who survived their birth, the former being to the latter as about 41 to 36; and in my own observations the weight of the still-born is to that of those born alive as 10 to 9 nearly. It is this great disparity of weight which has made the average proportions before and after respiration to differ much more than the absolute weight of the lungs in Mr Taylor's observations, and this same disparity has equalized the proportions obtained from my own facts. Here, then, is an obvious advantage of Ploucquet's test over the absolute weight of the lungs; and if the question to be decided was, which of the two should be preferred, there can be little doubt to which the superiority ought to be assigned.

The superior value of Ploucquet's test is still further shown by comparing the several proportions before and after respiration, in the same manner as the absolute weights of the lungs before and after respiration have already been contrasted. From this comparison it results, that whereas there were only eight instances in which the maximum weight of the lungs after respiration exceeded the maximum weight before respiration, there are no less than 29 instances in which the proportion which the lungs bear to the body is greater after respiration than before; that is to say, there are 29 instances in which, assuming the proportion 1 : 24 to be the true maximum, we could state with certainty that respiration had taken place. On the other hand, there is only one instance in which the proportion of the lungs to the body is less before respiration than the least proportion observed in children born alive;

in other words, there is only one case recorded in which, assuming 1 : 132 to be the real minimum after respiration, we should have been justified in asserting that respiration had not taken place. It appears, then, that Ploucquet's test has some advantage over the absolute weight of the lungs. But this advantage is gained, so to speak, at the expense of the very principle on which a numerical test ought to be founded, viz. an exact equality in all those particulars in which equality is attainable. In employing the weight of the lungs, or their weight as compared with that of the body, as a test of respiration, we compare an individual observation with an average previously ascertained; but this average has been shown to vary with the weight of the body, the weight of the lungs increasing more slowly than the weight of the body, and the proportion which the one bears to the other diminishing as the weight of the body increases. Hence, in order to construct a correct standard of comparison, we ought to contrast the weight of the lungs, both absolute and relative, before and after respiration for different weights of the body. This is done by combining tables XIV. and XV.*

Table XXXII.

No. of Obs.		Weight of Body.	Average weight of Body		Weight of Lungs		Proportion	
Before Resp.	After Resp.		Before Resp.	After Resp.	Before Resp.	After Resp.	Before Resp.	After Resp.
1	60	20000—30000	27030	26888	541	869	1 : 50	1 : 31
23	138	30000—40000	35263	34638	714	1061	1 : 49	1 : 32
27	69	40000—50000	44932	43549	744	1141	1 : 60	1 : 38
21	29	50000—60000	55555	54021	996	1332	1 : 56	1 : 40
17	14	60000—70000	64679	64251	1032	1431	1 : 63	1 : 45
4	9	70000—80000	77382	76127	1317	1379	1 : 58	1 : 55
1	2	80000—90000	87336	88041	1226	2193	1 : 71	1 : 40
2	3	90000 & upwards	96330	113783	1491	3273	1 : 64	1 : 34

If, after the observations which have been made on the static lung tests, any doubt temains of the inutility of these tests, and it is thought advisable still to employ them for medico-legal purposes, a table on the principle of the foregoing, but founded on a larger number of observations, will form by far the most accurate and unexceptionable standard of comparison.

I now proceed to detail a few facts which have come under my own notice, and to inquire how far the weight of the lungs and their weight as compared with that of the body corresponds with the general statements of authors, and with the numbers contained in the tables.

Obs. 1. Female at full term, still-born.

Weight of lungs, right lung, 356 grains; left lung, 276 grains; both lungs, 632 grains.

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* Some corrections have been made in this table.

Weight of body, 46735 grains.
Ploucquet's test, 1 : 74.

Obs. 2. Female at full term, still-born.
Weight of lungs, right lung, 372 grains; left lung, 275 grains; both lungs, 647 grains.
Weight of body, 38172 grains.
Ploucquet's test, 1 : 59.

Obs. 3. Male at full term, still-born.
Weight of lungs. Right lung. ℥i. ʒvi. Troy = 840 grains.
Left lung, ℥i. ʒii. ℈ii. Troy = 640 grains.
Both lungs, ℥iii. ℈ii. = 1480 grains.
Weight of body, lb. ix. oz. 11½ avoirdupois = 68031 grains.
Ploucquet's test, 1 : 46.

In the first two of these observations the absolute weight of the lungs, and their weight as compared with that of the body, are such as to render it more probable that the children were still-born than that they were born alive; the absolute weight of the lungs in both instances being much less than the average weight before respiration, viz. 874, and the proportion in both cases also falling below the average proportion, 1 : 57. Both values are also considerably less than the averages given in Table XXXII. Thus in the first observation, the weight of the lungs is 632, the average in the table for a body weighing between 40,000 and 50,000 grains being 744, and the proportion of the lungs to the body is 1 : 74, the average in the table being 1 : 60. In the second case, again, the values are 647 and 1 : 59, those in the table for bodies weighing between 30,000 and 40,000 grains, being 714 and 1 : 49. But it must be borne in mind that the numbers in the tables are merely averages, and that precisely the same numbers and the same proportions might be met with in children who had been born alive; so that taken alone, the static lung tests will furnish a very low presumption.

In the third case, the weight of the lungs is so much greater than the averages before and after respiration, as to raise a presumption in favour of respiration much stronger than the presumption in favour of still-birth in the first two cases. The average before respiration is 874, after respiration 1072; the weight of the lungs in this case was 1480, being 606 grains more than the average before respiration, and 408 grains more than the average after respiration; whilst it falls short of the maximum before respiration by only 181 grains. As far, then, as the absolute weight of the lungs goes, it would seem nearly decisive of respiration having taken place; Ploucquet's test gain tends to strengthen this conclusion, for the proportion which the lungs bear to the body, (1 : 46) falls little short of 1 : 38, the average after respiration has continued one month or less. On referring to Table XXXII, we have fresh reason for concluding that respiration has taken place for the absolute weight of the lungs corresponding to bodies, weighing from 60,000 to 70,000 grains, is 1431 after respiration, or somewhat less than the weight of the lungs in this case and Ploucquet's test gives 1 : 45 as the proportion after respiration being as nearly as possible the proportion in this instance. Hence, then, both the absolute weight of the lungs, Ploucquet's test, and the modified test of Ploucquet, would strongly incline us to the belief that the child had breathed; and yet, in this instance, respiration had certainly not taken place.

Obs. 4. Male, full term; survived its birth a few seconds, and was distinctly seen to respire more than once. Both lungs, however, sank, when placed in water, and the air-cells were not developed.

Weight of lungs, right lung, 300 grains; left lung, 210 grains; both lungs, 510 grains.
Weight of body, 31063 grains.
Ploucquet's test, 1 : 61.

Obs. 5. Male, full term; respiration imperfect, and of short continuance; air-cells developed in parts of the upper lobe of the left lung; and of the middle lobe of the right lung; the remainder of the lungs in the fœtal condition.

Weight of lungs, right lung, 690 grains; left lung, 488 grains; both lungs, 1178 grains.
Weight of body, 11 pounds avoirdupois = 77,000 grains.
Ploucquet's test, 1 : 65.

Obs. 6. Male, full term; respiration imperfect, but more extensive than in Obs. 5. The child had lived about an hour.

Weight of lungs, 726 grains.
Weight of body, 39,812 grains.
Ploucquet's test, 1 : 55.

Obs. 7. Male, eight months and a-half, lived two days. Respiration perfect in right lung, extremely imperfect in left lung. Blood effused in spots of variable size on the surface of both lungs. These spots small and few in number in the right lung, more numerous and larger in the left lung, especially on its posterior surface.

Weight of lungs, right lung, 295 grains; left lung, 251 grains; both lungs, 546 grains.
Weight of body, 32,375 grains.
Ploucquet's test, 1 : 59.

The first of these four observations is classed with those in which respiration has taken place, though the effects of respiration did not manifest themselves in the lungs. The air probably did not penetrate beyond the bronchial tubes, and left the lungs, to all appearance, in the fœtal condition. The small weight of the lungs, and the low proportion which the lungs bear to the body, afford a probability in favour of still-birth. The child, however, was born alive, and was distinctly seen to respire.

In the next case, (Obs. 5) there was abundant evidence of respiration, and the appearance of the lungs corresponded with the statement of the midwife, that the child had breathed. The lungs weighed 1178 grains, which exceeds the average weight in children who have lived one month or less by more than 100 grains. The absolute weight of the lungs, therefore, furnishes a low probability in favour of respiration. This probability is strengthened if the weight of the lungs is compared with the mean weight of the lungs of children who have lived less than one hour, the average being 918 grains, or with the average weight in cases of imperfect respiration, which for males is 1010 grains, (see Table X.) On the other hand, it must be borne in mind that the body of this child weighed no less than 77,000 grains. Ploucquet's test, therefore, gives the proportion of 1 : 65, which affords as strong a probability in favour of still-birth, as the absolute weight of the lungs did in favour of respiration. By comparing the weight of the lungs with the average weight for bodies exceeding 70,000 grains in weight (see Table XXXII.) this probability in favour of still-birth is still further increased.

The weight of the lungs in Obs. 6, viz. 726 grains, though below the average weight before respiration, is not low enough to afford a very strong presumption either way, and the proportion 1 : 55 gives a slight probability in favour of still-birth, (see Tables XXXI. and XXXII.) In the last case, (Obs. 7,) the weight of the lungs, and the proportion which the lungs bear to the body, are such as to give a strong presumption in favour of still-birth; but in this instance, the child had lived two days, and the weight of the lungs was increased by the effusion of blood on the surface of the lung, around the superficial air-cells, and beneath the pleura. I may observe in passing, that this is the only case out of twenty-two which I have had an opportunity of inspecting, in which any disease of the lungs existed, and in this case, with the exception of the pulmonary apoplexy, the structure of the lungs was perfectly healthy.

The question of respiration in the seven cases which have been mentioned would have been decided by means of the static lung tests as follows. Of the three still-born children, two would have been pronounced probably still-born; in the third there would have been a strong presumption in favour of respiration. Of the four children who had survived their birth, the first would have been pronounced still-born; in the second, the absolute weight of the lungs would have furnished a strong probability in favour of respiration, and Ploucquet's test, as well as the modified test, (see Table XXXIII), as strong a presumption against it; in the third case, there would heve been a slight presumption in favour of still-birth; and in the child who survived its birth two days, a still stronger presumption on the same side. Thus out of the seven cases, the static lung tests would have given correct indications in two, they would have left two others doubtful, and would have led to erroneous conclusions in the remaining three. These remarks apply to the average weight of the lungs, and the average proportion which the lungs bear to the body when used as tests of respiration; but if the highest and lowest weights and proportions had been employed as standards of comparison, the question whether the child had or had not breathed would have remained unanswered. Now it admits of great doubt whether it is allowable to employ an average value as a standard of comparison in medico-legal inquiries. Even in the practice of medicine, where many low probabilities are allowed to assist us in our diagnosis, average values are amongst the least useful and the least trusted of our standards of comparison, and very few physicians would be hardy enough to rest any important conclusions upon so insecure a basis. What medical man, for instance, would think of placing much reliance on an average frequency of the pulse, or the average proportion of the pulse and respiration as a standard of comparison in a case of disease? They would furnish a low presumption, and nothing more. On the other hand, a comparison between the frequency of the pulse in a given case of disease, and the highest or lowest ascertained frequency in a state of health, would furnish important indications on which he would be justified in laying great stress. A mode of reasoning which would be inadmissible in a case of disease where a low probability derived from one symptom is confirmed by the presence or absence of a considerable number of other signs, can scarcely be trusted to in medico-legal inquiries, which demand a much higher accuracy, and a much stricter logic. If in a court of law, a medical witness were to state that, in a certain case, he had found a certain weight of lungs, and a certain proportion between the weight of the lungs and that of the body, and that he regarded this as a proof of respiration or of still-birth, or even as a presumption in favour of one or the other, he would be immediately met by the question—has not precisely the same weight of lung, or the same proportion, been met with in cases where the exact reverse of your inference was known to have existed? To this question an answer must be given in the affirmative, except in those instances in which the weight exceeded the highest recorded weight or proportion, or fell short of the lowest; and these cases have been shown to be extremely few in number. But even when the extremes are employed as our standard of comparison, our inference in individual cases is open to the obvious objection, that the real extremes have not yet been ascertained. The force of this objection must be allowed, and to obviate it, it would be necessary to strengthen the presumption by collateral evidence derived from other signs.

If the static lung tests were always regarded in the same light as the symptoms of a disease; that is to say, as furnishing merely one element of our diagnosis or prognosis, little mischief could arise from attaching some slight value to them. The low presumption which this test, taken by itself, would furnish, might be increased by other collateral evidence, so as to amount to a high probability, or even to certainty. But this is not the case, for not only are the static lung tests employed in combination with other tests, such as the size and shape of the chest, the position of the diaphragm, the size, position, consistence, and appearance of the lungs, (all of which furnish their presumptions in favour of or against respiration,) but they are also recommended, as one of the surest means of distinguishing the effects of respiration from those of inflation. It is obvious that the lungs are not increased in weight by inflation, and, taking one case with another, it is as certain that their weight is increased by respiration, for this reason, the weight of the lungs has been regarded as a means of diagnosis. Now it has been already shown that the static lung tests are not to be relied on as a means of distinguishing lungs which have respired from those which have not; and as inflated lungs are assumed to remain as far as weight is concerned in the condition of lungs which have not breathed, it follows that the weight of the lungs is not a sufficient diagnostic mark of respiration and inflation. Whatever value is assigned to these tests as tests of respiration, exactly the same value must be given them as tests of inflation. How slight this value is has already been shown.

Those who are familiar with the changes produced in the appearance of the lungs by respiration, will readily admit that, in at least ninety-nine cases out of a hundred, the question of respiration is nearly decided by the first glance at the surface of the lungs themselves, without having recourse to the static lung tests at all, or even to the hydrostatic test. Simple inspection is sufficient to show that either respiration has taken place, or that inflation has been practised. The static lung tests, therefore, are not required to distinguish respiration from non-respiration, but merely to serve as a diagnostic mark between respiration and inflation. Here, then, where alone these tests are wanted, they fail us, just as they fail us in almost every instance in which they are used to determine the question of respiration. If we had as certain means of distinguishing respiration from inflation, as we have of determining that one or the other has taken place, the static lung tests would be as unnecessary as they are useless. Whether or not we possess a means of diagnosis in the effects of pressure must be left for future consideration.

The conclusions drawn from the examination of the seven mature children are fully borne out by observations made at earlier periods of fœtal life. Some of these observations will find a place in a future essay on the hydrostatic test. I shall content myself for the present with detailing a case of some interest in more than one point of view, and instructive in its relation to the static lung tests. For an opportunity of inspecting the lungs, and for the minute particulars which give completeness to the case, I am indebted to the courtesy of Mr Streeter, who has kindly allowed me to copy from his note-book that part of the case which came under his own notice.*

" Mrs J. R., aged 28. Her second pregnancy. She menstruated last on Whitsunday, June 7th 1840, and was taken with pains, December 1, about ten A. M. She came to bespeak my attendance for March next. I gave her an opiate mixture to take on her return. Of this she took one dose, but the pains continued increasing till she sent for me between two and three P. M. On my arrival I found on examination, in the intervals of the pains, that the *os uteri* was open to the size of an orange, and a bag of waters protruding. At half-past four, the bag broke, and a very large quantity of waters came away. The head of one fœtus was expelled through the *os externum* ; the body was extracted after some slight resistance, and the funis tied. A second gush of waters now took place, and I found the placenta occupying the vagina. I slowly brought this through the *os externum*, but, as it was still retained, I again examined, and found the arm and face of the second fœtus presenting. Fixing the arm steadily with the finger and thumb of my left hand, I passed the fore-finger of the right hand over the neck of the fœtus, and so succeeded easily in dislodging it from the upper part of the vagina, without causing much pain. The uterus was found firmly contracted above the pubis.

Both fœtuses were females ; they made respiratory efforts, but without oral sound, and, of course, shortly expired. The largest is marked 1, the smallest 2.

Weight of body, -	1. 21½ oz. avoirdupois. 2. 10½
Circumference of the head, -	1. 8½ inches. 2. 7
Abdomen, - -	1. 7½ 2. 5
Length, - - -	1. 12⅓ 2. 10
Length of cord, - -	1. 16 2. 11

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* This case was detailed at one of the meetings of the Westminster Medical Society, and is reported in the Lancet 1840—41.

To the foregoing extract from Mr Streeter's note-book, I add the following account of the *post mortem* examination, which took place December 6.

Both fœtuses were found contained in a common chorion, but in distinct amnia.* The placenta belonging to the larger fœtus was of the common size; that corresponding to the smaller fœtus was about half as large, and had the cord inserted into its edge. Both placentæ were quite healthy. Having secured the vessels of the lungs by ligature, those organs were weighed, and the following numbers were noted down on the spot.

Largest Fœtus.—Weight of lungs, right lung, 73 grains; left lung, 55 grains; both lungs, 128 grains.

Weight of body, 9406 grains.

Ploucquet's test, 1 : 73.

Smallest Fœtus.—Weight of lungs, right lung, 23 grains; left lung, 15 grains; both lungs, 38 grains.

Weight of body, 4594 grains.

Ploucquet's test, 1 : 121.

The lungs of the larger fœtus, when placed in water, sank at once to the bottom, without showing any degree of buoyancy. All the lobes and the several portions into which they were divided, likewise sank, and the lungs presented no trace of respiration. The lungs of the smaller fœtus presented the following appearances:—On the convex surface of the upper lobe of the right lung the air-cells were distinctly developed in four or five different points, and nearly the whole of the concave surface was studded in the same manner. The inferior and middle lobes of the same lung had a great number of such points on the convex surface, and also on the concave surface, especially along the anterior margin. This lung, however, on being placed in water, sank at once to the bottom. The left lung presented no trace of respiration, the surface of the lung being perfectly uniform, with not a single air-cell developed. This lung also sinks on being placed in water. The right lung was now divided into its three lobes, and each lobe submitted to experiment. They all sank to the bottom of the vessel. On cutting off a small portion of the lower lobe of the right lung, containing several developed air-cells, and placing it in water, it sank rapidly to the bottom. A portion of the middle lobe, towards the posterior margin, being placed in water, floated. Very strong pressure applied to this portion did not destroy its buoyancy, but, on increasing the pressure with the finger and thumb, the buoyancy was somewhat diminished. After the entire destruction of the texture of the lung by repeated pressure, this portion slowly sank to the bottom.

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* This fact was verified by a very careful examination, and admitted by more than one competent authority.

This case is interesting and instructive in so many points of view, that I have given it entire, though my present business is merely with that part of it which refers to the static lung tests. The ages of these fœtuses might have been six months at the most, five months at the lowest calculation, and five and a-half months reckoning from the middle period between the last menstruation and the next menstrual period. Mr Streeter thought five and a-quarter months the most probable age. In any case the abortion took place in the sixth month. Both fœtuses had made efforts to respire, the larger one without success, (for if any air did reach the lung, it did not expand any of the air-cells,) the smaller one successfully, the air-cells being developed in large numbers on the surface of the right lung. The small quantity of air admitted was insufficient to give buoyancy either to the entire lung, or to any of its lobes, but it caused a small portion of one lobe to float. As inflation was not practised in this case, there is no room to doubt that the child had breathed. Here, then, we have two twins of the same sex, inclosed in a common membrane, and the product of the same conception, the one more than twice as large as the other, and, to appearance, far better prepared to respire, both making respiratory efforts, and yet the smaller and feebler child alone succeeded in drawing air into the lungs. The lungs of the larger child were found filled with blood, those of the smaller almost bloodless; the one weighed 128 grains, or $\frac{1}{73}$ of the weight of the body, the other 38 grain, or $\frac{1}{131}$. The weight of the bodies were as 2 to 1, that of the lung as 3 to 1. Is it not at least probable that the comparatively large quantity of blood contained in the lungs of the larger child was an obstacle to the admission of air; whilst the almost bloodless condition of the lungs of the smaller was peculiarly favourable to respiration? If this supposition be not allowable, and the larger quantity of blood contained in the lungs of the larger fœtus was not in the lungs previous to the efforts made to respire, then these efforts must themselves have caused an influx of blood, whilst in the smaller child the same efforts led to the admission of air. My own experience, as far as it goes, has led me to the conclusion, that the presence of a large quantity of blood in the lungs is a frequent occurrence in still-born children, and in cases of extremely limited and imperfect respiration; and that where respiration has been most complete, the quantity of blood is often small as compared with their bulk. The case of the smaller fœtus is peculiarly interesting, as the weight of the lungs is much less than in any other instance on record. The smallest recorded weight which I have met with occurred in a six months' child entered in Lecieux's tables. It is 93 grains. It is stated that this child made efforts to respire, but the lungs were compact. The body weighed 10,040 grains, and Ploucquet's test gave the proportion of 1 to 108. I have not admitted this into the tables, as there is not sufficient evidence of respiration having taken place. 88 grains, then, is by far the smallest weight yet reported in a case where respiration has taken place, and there can be no doubt that the static lung tests, taken alone, would have led to the conclusion that the child was still-born.

There are other points of interest in this case on which it is not my present object to enlarge; such as the existence of a common chorion; the evidence thereby afforded of contemporaneous conception; the unequal weight of the two bodies, in the absence of any disease in the placenta; the correspondence of the size of the bodies with that of the placentæ to which they were attached; and the absence of buoyancy in lungs in which the air-cells were so visibly developed by the entrance of the air; these points, as they do not belong to my present inquiry, I content myself with merely alluding to, and shall, therefore, conclude what I have to say upon the static lung tests, reserving the hydrostatic test for a future occasion.

The following short summary will embody the principal conclusions which I have been led to form, and will at the same time give me an opportunity of correcting some errata contained in my former essay.*

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* The calculations contained in the former essay were, with one exception, originally correct, and I can only attribute the alterations which I was induced to make to my great anxiety to avoid all sources of fallacy, and the pressure of an unusual number of engagements at the time when the proof-sheets reached me. From these causes I was induced to make alterations which I subsequently found to be uncalled for. I discovered my mistake almost as soon as I had made it, and wrote to the editor, begging that he would allow the tables to remain as they were, but the proof-sheets had already gone to press. Finding that I had committed one error, I carefully reviewed my observations, and tested the accuracy of all my calculations from the French and German weights, and I discovered one other error. The maximum weight before respiration in mature children was stated on the authority of one of Devergie's observations at 1800. On examining the case from which this number was taken, I found that I had taken the weight of the heart, lungs, and thymus, instead of the weight of the lungs alone. Those who are familiar with Devergie's work, and with the manner in which his cases are recorded, will not attribute this mistake to mere carelessness. The discovery of this error has led me to convince myself of the accuracy of the rest of my calculations. I have taken considerable pains to correct this error, as well as the more important one just mentioned, and have reconstructed the whole of the tables. The corrections, with the exception of the observation from Devergie, are not material, and in no way affect the general reasoning employed. I subjoin a list of the errata.

P. 47, omit the passage beginning "In reducing, &c." and ending with "calculations," the grains in the table are Troy grains.

Table I., *for* 1800 *read* 1661; *for* the average values substitute 950, 809, 874. In the paragraph succeeding the table omit 1800 and 1726.

Table II. *For* the mean values, substitute 382, 340, 361, 600, 678, 625, 695, 690, and 686.

P. 50, line 5, *for* more than 300 *read* nearly 200.

Table III. *For* 1800 *read* 1661; *for* the mean values write 361, 625, 686, and 874.

Table IV. The averages are 1121, 982, 1072.

Table V. The averages are 320, 441, 401, 589, 694, 638, 761, 734, 751.

Weight of the Lungs.—1. The weight of the lungs of still-born children of the same age varies within wide limits; the chief causes of difference being the sex and the weight of the body.

2 The weight of the lungs in mature still-born children is as follows: greatest weight, 1661; least weight, 340; average weight, 874.

3. The weight of the lungs in mature still-born children of the male and female sex respectively is as follows: greatest weight, 1661, 1492; least weight, 360, 340; average weight, 950, 809.

4. The weight of the lungs in children who have respired also varies within wide limits; the chief causes of difference, in addition to those which affect still-born children, being the degree and duration of respiration.

5. In children who have survived their birth one month or less, the highest recorded weight is 2440 grains; the lowest 432 grains; and the average 1072 grains.

6. The weight of the lungs for males and females respectively, at the same ages, is as follows: greatest weight, 2440, 1745; least weight, 432, 479; average weight, 1121, 982.

7. The weight of the lungs increases with the increasing perfection of the respiration, but is very slightly augmented by imperfect respiration.

8. The weight of the lungs also increases with the duration of the respiration; but appears to be less when respiration has continued more than one hour and less than twelve, than when it has lasted less than one hour.

9. The mean weight of the lungs in mature children who have

Table VI. The averages are 401, 628, 751, 1072.

Table VII. The averages are 911, 780, 918, 955, 726, 853; 1001, 1018, 1000.

Table VIII. In the male *read*, 911, 955, 1001, 1067, &c.; in the female 780, 726, 1018, 725, 980, 913, &c.; and in the third line *read* 918, 853, 1000, 985, 1001, 1128, &c.

Table IX. Under the head one day and less, *read* male 943, female 826, m. and f. 925.

Table X. *For* 1800, *read* 1661. In the first column of the line of averages, write 950, and in the last but two 874.

Table XI. *For* 1800 *read* 1661. The average values are 874, 918, 853, 1000.

P. 9, in text following table XI., *for* 38, *read* 44, and *for* 34, *read* 21.

Table XII. The averages are 361, 401; 625, 638; 686, 751; 874, 1000.

P. 54, 9 lines from bottom, *for* "exceeds," *read* "falls short of," *for* 75, write 64; for 1800, *read* 1661, *for* 37 *read* 21, *for* 38 *read* 44, and *for* 122, *read* 126.

Tables XIV. and XV. are connected and combined in table XXXII. of the present essay.

P. 60, *for* 1800, *read* 1661.

Table XX. The averages are 1 : 53, 1 : 63, and 1 : 57.

Table XXI. The averages are 1 : 40, 1 : 41; 1 : 41; 1 : 41, &c.—1 : 46

Table XXII. The averages are 1 : 41, 1 : 41, 1 : 46, 1 : 57.

Table XXVIII. The averages are 1 : 57, 1 : 51, &c. In the text *read* 57 *for* 56.

Table XXIX. The averages are 1st column, 1 : 41, 5th column, 1 : 46, 7th column, 1 : 57.

Many of the above corrections are merely repetitions, and some are typographical errors, which were unavoidable in so large a mass of figures.

lived one month or less exceeds the mean weight in mature still-born children, by somewhat less than one-fourth, the numbers being 574 and 1072.

10. The average and extreme values drawn from small numbers of facts differ widely from each other, and cannot be depended upon for medico-legal purposes.

11. The average values cannot be safely employed as standards of comparison, and the extreme values admit of very rare application.

12. If the absolute weight of the lungs is employed as a test of respiration, the value obtained in an individual case ought to be compared with the average or extreme numbers obtained for the same weight of body. (See Table XXXII.)

The following propositions have an important bearing on Ploucquet's Test.

1. The weight of the lungs both before and after respiration increases with the weight of the body; but the proportion which the lungs bear to the body decreases as the weight of the body increases.

2. For the same weight of body the weight of the lungs varies within wide limits, and *vice versa,* for the same weight of lungs the weight of the body varies within wide limits. This variation is more considerable after respiration than before it.

3. The weight of the body in still-born children is greater than in children born alive; the former exceeding the latter by nearly one-third.

4. The weight of the lungs is subject to much greater variation than that of the body.

5. The weight of the lungs is much greater in the male than in the female.

1. *Ploucquet's Test.*—The proportion which the weight of the lungs bears to that of the body, like the absolute weight of the lungs, varies within wide limits; the proportion in mature still-born children being as follows: greatest proportion, 1 : 24; least proportion 1 : 176; average proportion, 1 : 57.

2. The proportion in males and females respectively is as follows; greatest proportion, 1 : 24, 1 : 36; least proportion, 1 : 176, 1 : 119; average proportion, 1 : 53, 1 : 63.

3. In children who have survived their birth one month or less, the highest recorded proportion is 1 : 19; the lowest, 1 : 132; and the average, 1 : 38.

4. The proportion for males and females respectively at the same ages is as follows: greatest proportion, 1 : 19, 1 : 19; least proportion, 1 : 132, 1 : 96; average proportion, 1 : 35, 1 : 43.

5. The proportion which the lungs bear to the body increases

with the increasing perfection of the respiration, but is very slightly augmented by imperfect respiration.

6. The proportion also increases with the duration of the respiration, but appears to be less when respiration has continued more than one hour and less than twelve, than when it has lasted less than one hour.

7. The average proportion in mature children who have lived one month or less, exceeds that in mature still-born children; the numbers being 1 : 57 before respiration; and 1 : 38 after respiration.

8. The proportions calculated from a small number of facts differ widely from each other, and cannot be depended upon for medico-legal purposes.

9. The average proportions cannot be safely employed as standards of comparison, and the extreme values, though more to be depended on than the highest and lowest weight of the lungs, are of very limited application.

10. If the average or extreme proportions are employed as standards of comparison. the proportion obtained in any individual case must be compared with the average or extreme numbers calculated for the same weight of body. (See Table XXXII.)

The observations contained in the present essay lend strong confirmation to the unfavourable opinion expressed on a former occasion of the static lung tests as tests of respiration. Whether employed to distinguish respiration from non-respiration, or respiration from inflation, they are alike insufficient, except in cases of extremely rare occurrence, where we can make use of the extreme values. On the supposition that the question of inflation has no place, the static lung tests are as unnecessary as they are useless; if we have proved that either respiration or inflation has taken place, they can only be employed with advantage in the extremely rare instances just alluded to, viz. where we can employ the extreme values. Hence, then, the proposition which concludes my first essay requires to be slightly modified, and will stand thus.

The static lung tests are utterly useless for all practical purposes, and ought not to be relied on in medico-legal inquiries, except in rare instances, where the extreme values can be employed.

Art. II.—*On the comparative advantages of Lithotomy and Lithotrity, and on the circumstances under which one method should be preferred to the other; being the Dissertation for which the Jacksonian Prize of* 1838 *was awarded to* Edwin Lee, M. R. C. S., Corresponding Member of the Medical and Chirurgical Societies of Paris, Berlin, Naples,

Florence, Bologna, Bordeaux, Lyons, Marseilles, and Toulouse, &c.

Vires acquirit eundo.

I. A subject of greater importance, or one more interesting to the community at large, could scarcely have been selected from the whole circle of the science of surgery for a collegial prize essay, than a comparison between lithotomy and lithotrity, with a view to determine the superior applicability of the one operation over the other, in particular cases; especially as the greater number of the profession in Britain know as yet but little of the merits or demerits of the latter method of removing stones from the bladder, beyond the cases and statements too often partially given, which have from time to time appeared in print; and it is to be regretted that a long period must still elapse ere this operation can be so generally known and practised as to lead to a correct appreciation of its value. This can scarcely be the case, till it is included with other operations in the usual course of study, as in Paris, where the pupils not only have frequent opportunities of seeing the operation performed, but also of making themselves familiar with the instrumental manœuvres, by repeated trials upon the dead body, so essential before operating on the living, and without which the operator would have occasion to rue his temerity, from the supervention of accidents less attributable to the operation itself, than to its being improperly performed. Not that the performance of the operation, as at present simplified, presents any peculiar difficulty in most cases; neither does it require a long course of previous study, as many persons have been led to suppose; but that the simplest process often appears difficult till it is understood, and a certain degree of tact is required, which can only be obtained by practice.

My attention having been a good deal directed to lithotrity during the last five or six years,—my frequent visits to the continent within that period having afforded me opportunities of becoming acquainted with the methods of performing it, and of estimating its advantages—I was desirous of causing the operation to be better known and appreciated in England, and with this view, gave two years ago, some public demonstrations in London, and three of the larger provincial towns. The very flattering manner in which these were attended, afforded me an additional proof of the high interest attached by the profession to the subject, and that every opportunity would be gladly embraced of becoming better acquainted with this new means of removing one of the most distressing afflictions to which mankind is liable.*

To institute a comparison between lithotomy and lithotrity, and to endeavour to point out the cases most suitable for either, presents, however, peculiar difficulties, inasmuch as though some cases may be pretty clearly defined, as being more especially adapted to one or the other operation, there will always be a great number of others, between which it would be impossible to draw a line of demarcation; and these will require considerable exercise of the surgeon's judgment in taking into account the peculiarities in individual cases, to enable him to determine, which of the two operations would offer the greatest liklihood of relieving the patient from his disease, with the smallest amount of present inconvenience, and the least risk of ulterior consequences; and it is not without great diffidence that I enter upon the inquiry. Previous, however, to offering an opinion on some of the circumstances which more especially appeared to indicate the one or other mode of operating, I shall briefly allude to some points respecting the nature of calculi and the condition of the urinary organs; and shall subsequently treat of lithotomy and lithotrity; confining myself as strictly as possible to such as are of a practical nature, and more immediately connected with the subject of the dissertation.

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* This was written nearly three years ago—May 1841.

II. *Of calculi in the bladder, and the means of ascertaining their properties.*—A knowledge of the physical properties and chemical composition of the urinary concretions met with in the bladder, has become of much greater importance since the invention of lithotomy, than when cutting into the bladder was the only operation resorted to, whatever the nature of the foreign body to be extracted; as such knowledge will often serve to guide the surgeon in determining to which operation he should give the preference. It must be confessed, however, that the means which we possess are very insufficient to enable us to obtain accurate information on this head. Of these means, sounding is the only one which admits of our verifying with any approach to certainty the existence of stone in the bladder, and of judging of its physical properties; but the information furnished by the sound is very often exceedingly fallacious, not only as regards the number of the foreign bodies, their size, &c. but even with respect to their very existence. One surgeon will frequently feel, or imagine he feels, a stone in the bladder, while another would not be able to feel it, or would ascribe the sensation he experienced on sounding to other causes. In the common practice of sounding patients in a standing or recumbent position, it is often extremely difficult to detect a stone in the bladder, especially if it be small and lodged behind and beneath the prostate, which is of very common occurrence; more particularly if there should co-exist enlargement of this gland; and numerous cases are recorded, both in ancient and modern times, where surgeons of acknowledged ability have failed to detect stones in the bladder, even when they have been as large as a hen's egg or larger. M. Leroy D'Etiolles mentions in his work,* a case where, on the first exploration of the bladder, no stone could be detected by the surgeon; on a second examination, a stone was felt, but was pronounced to be of small size; yet the bladder contained a calculus, weighing two ounces and a half, which was extracted after having been broken into pieces, by the recto-vesical operation, in consequence of which the patient died. The same author quotes another case from the practice of a surgeon, whose attention was specially directed to lithotrity, and who sounded a patient three times, without being able to feel a stone, notwithstanding the bladder contained one which weighed four and a-half ounces, and measured three inches in its longest diameter. Several analogous examples are related by M. Civiale in his Parallele des divers moyens de traiter les Calculeux. Mr Hodgkin has also stated a case (in the London Medical and Surgical Journal for October 1837) of a child, two years of age, who laboured under symptoms of stone, which, however, could not be detected by sounding through several examinations were made by experienced surgeons; yet, after the patient's death two calculi were found in the bladder, each of the size of a pigeon's egg. In a patient, who was sounded at the Hotel-Dieu, it was supposed that the bladder contained so large a stone, as not only to render lithotrity altogether inadmissible, but even to counter-indicate the performance of lithotomy by the perineum. All the assistants were of the same opinion as the surgeon, and the high operation was consequently performed by Dupuytren, who, after a period of twenty minutes, employed in seeking the stone, at length extracted one, the largest diameter of which did not exceed eighteen lines, its smallest diameter being only seven or eight. The patient died shortly after the operation. At the same hospital, a similar error occurred more recently. It was expected that the operation would present extraordinary difficulties, on account of the excessive size of the stone, and on the supposition that it could not be extracted entire, instruments were brought into the theatre, wherewith to break it; yet it fell out of itself through the incision in the soft parts, which had been made too large.† Several cases are also on record, where examination with the sound has misled surgeons of experience, inducing them to believe that a stone existed in the bladder, where such was not the case, and operations of lithotomy have consequently been uselessly performed. This occurred more than once to Cheselden, twice to Dupuytren, and, according to his own candid admission, four times to M. Roux. M. Civiale states that analogous instances have more recently occurred in the hospitals of Paris, Vienna, and Munich. Mr Crosse likewise operated on a patient, though uncertain of the existence of stone; the bladder, in fact, contained no stone, but two large fungous masses, and several smaller ones. Another case is related by Mr Key in the Guy's Hospital Reports, where lithotrity was recommended, though it was subsequeutly ascertained that the bladder contained no stone.

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* De la Lithotripsie.

† Civiale, Traité de l'affection Calculeuse.

Thus we see that reliance cannot always be placed on an examination of the bladder by the sound; even as far as concerns the presence or absence of calculi; still less on their size, density, and composition; though in many cases a tolerably near guess may be formed on these points, by the extent of surface traversed by the sound, laterally and from before backwards; by the weight of the stone when pushed on one side, by the kind of noise caused by striking it; as, if it be hard,—as of the oxalate of lime or lithic acid varieties,—a clear distinct sound will generally be emitted; while, should it be of the phosphatic variety, the sound on percussion will, in most instances, be dull, as when a piece of chalk is struck with a metallic rod. Were more care taken to sound patients in different positions than is generally done, especially with the pelvis raised higher than the abdomen and with the bladder in alternate states of fulness and emptiness, information of a more definite character might frequently be obtained even with a common sound; and still better by the employment of lithotritic instruments, which have in several instances served to detect stones and fragments in the bladder after the sound had failed in ascertaining their presence. For this purpose the curved instruments appear to me better adapted than the straight three-branched lithotrite of Civiale, inasmuch as the shortness of their curve admits of their being turned completely round in the bladder, and enables the surgeon to feel with the beak of the instrument foreign bodies lodged behind and beneath the prostate gland, which a common sound or a straight instrument like Civiale's would pass over, and leave undetected, especially in cases where there exists enlargement of this substance. In obscure cases a lithotritic instrument has, moreover, the advantage of ascertaining more accurately the size of the stone, as when this is seized the surgeon may always see by referring to the graduated scale near the handle, the exact diameter of the part embraced between the branches. With this instrument, also, the surgeon is better able to ascertain whether the bladder contain more than one stone, as, by moving the instrument in various directions with the stone in its grasp, it would in all probability strike against other stones if any existed; and if the stone were not hard, its composition might be known, or at all events, that of its outer layer, from the nature of the detritus adhering to the instrument after it is withdrawn. Explorations of the bladder, however, with lithotritic instruments are generally more painful than ordinary sounding, and are not always harmless;

being sometimes followed by symptoms of a serious and even of an alarming nature. Hence they are not to be recommended indiscriminately, but in doubtful cases may be of great service in affording the surgeon such information as may enable him the more readily to determine upon the operation to be preferred, and also after lithotrity, to ascertain that the bladder has been completely freed from the presence of the foreign body.

Examination of the urine and its deposits will sometimes throw considerable light upon the nature of calculi contained in the bladder; though the information obtained by this means can only be relied upon when confirmed by other circumstances. Thus when a person has been for some time in the habit of passing lithic acid gravel, and a calculus is subsequently detected, we may reasonably infer that it is of a similar composition, though, at the same time, it must be borne in mind that the prolonged sojourn of a foreign body in the bladder frequently induces pathological states in this viscus, by which the original nature of the stone is very much or altogether changed. In many stone-patients, however, the urine is to all appearance perfectly healthy, and does not deposit any sediment. Dr Prout indeed, states, with respect to the urine of stone-patients, *1st*, That the urine of persons who have a lithic acid calculus, is generally of a dark colour, of greater specific gravity than healthy urine, almost always depositing a red crystallized sediment, which is more abundant whenever pain and irritation exist. *2dly*, The mucus from the bladder is less abundant than when other kinds of calculi are present. *3dly*, Lithic acid calculi do not give rise to such formidable symptoms as other kinds, and may even remain in the bladder for a longer or shorter period without the existence of symptoms which would cause their presence to be suspected during the patient's lifetime. *4thly*, Calculi composed of the phosphates cannot exist long in the bladder, without producing all the symptoms of stone and general derangement of the health. *5thly*, The urine of patients with these calculi is abundant, of little density, and slightly opaque, somewhat analogous in appearance to whey, the phosphates being precipitated in the form of a pulverulent sediment mixed with a certain quantity of mucus; the urine becoming speedily decomposed on exposure to the atmosphere. *6thly*, The urine of persons who have an oxalate of lime calculus is generally clear and does not contain sand or gravel.

Other high authorities upon the same subject dissent from some of the preceding opinions. From the experiments made by Fourcroy, this distinguished chemist observed, and his observations have been recently corroborated by the investigations of M. Chevallier, that there is almost a total absence of uric acid in the urine of most stone-patients, indicating that the calculi formed are composed of this substance. Dr Prout's opinion of the physical characters of the urine of persons who have lithic acid calculi is also different from that of Fourcroy and Chevallier, which shows the necessity of further investigation to elucidate these points. It is also well known that phosphatic and oxalate of lime calculi, as well as those composed of lithic acid, have in several instances been found in the bladders of individuals after death, when no symptoms had existed to indicate their presence.

The urinary calculi most commonly met with in practice are composed of uric acid, or urate of ammonia; of oxalate of lime; and of the ammoniaco-magnesian phosphates; several, however, having a mixed composition, or a nucleus of one substance, and superimposed layers of another substance. The proportion of uric acid calculi greatly exceeds that of the mulberry and phosphatic varieties, as will be seen by a table which I have annexed in the appendix. Oxalate of lime calculi are generally the hardest, heaviest, and most irregular on their surface. Some, however, of this composition are less hard than lithic acid ones, and are easily broken with a lithotritic instrument. Next in order with respect to hardness and specific gravity are uric acid calculi, while those composed of the phosphates are much lighter and more friable; occasionally so much so, as to fall to pieces in the bladder.

The great variety in the composition of urinary calculi, according as to whether they are of a similar nature throughout, or consist of different substances, as well as the varying proportions in which their elements are mixed together, render them very different in point of density. The majority are either soft and friable, or of moderate hardness, and may be crushed without the employment of much force. Some, though hard, are brittle, and though not easily broken by pressure, readily yield on being struck a sharp blow with a hammer or metallic instrument. Some, again, are much harder than others which have a similar chemical composition, which may depend upon the length of time the disease has existed upon the proportion of animal matter which binds the earthy parts together, &c. As M. Civiale has very justly observed, the erroneous impression which existed with respect to the great hardness of many calculi, is attributable to the circumstance, that the investigations to ascertain this point have been for the most part made on the dried specimens from museums, or which had long been removed from the body, and become hardened by exposure to the air; between which and the calculi existing in the humid medium of the living bladder, there exists a considerable difference in this respect.

With regard to uric acid or urate of ammonia calculi, which are the most common (those of pure uric acid being extremely rare) M. Civiale states in his work before-mentioned, that they are divisible into two classes, according to the slowness or quickness of their development; some are smooth, polished, very hard and heavy, and increase very slowly in size; while others are rougher, light and friable, of a deep yellow colour; and acquire a considerable size in a short time.

In general, calculi of a similar composition throughout are hardest at their centre. When composed of different substances the nucleus is usually the hardest part, though, when a concretion is formed round a foreign substance accidentally introduced into the bladder, especially if it be soft or of vegetable nature, as a pea, piece of straw, of elastic gum catheter, &c., the central part is often less hard than the superimposed layers; such calculi, however, mostly consist of the phosphates, and are consequently soft and friable.

Of the Urinary Organs as connected with the question.—I purpose in this place merely to allude to a few points relating to the urinary organs, as I shall have occasion, subsequently, to consider some conditions of these parts, which more especially serve as indications in the choice of the operation to be preferred.

Though the majority of urinary concretions descend from the kidneys to the bladder, and there acquire a greater development, yet they sometimes remain impacted in the kidneys, or are arrested in their descent through the ureters till their progressive increase gives rise to such organic alterations as occasion the patient's death. It is only, however, after the foreign bodies have descended into the bladder that they can come within the scope of a surgical operation, and consequently the condition of the kidneys and ureters, although a matter of great importance in estimating the probable advantages and disadvantages of an operation, and in the choice of the method to be adopted, has less claim on the especial attention of the surgeon, than that of the bladder and urethra, which parts present considerable varieties in different individuals, requiring to be attentively considered when the greater applicability of lithotomy or lithotrity becomes a question.

The urethra, which in adult males is usually of from seven to nine inches in length, and of an average diameter of from two and a-half to three and a-half lines, is considerably narrower at some points than at others; more especially at the orifice, and the membranous portion, at which part a curve is formed by its being bound up to the arch of the pubis by the triangular ligament. This curve is much more decided in some persons than in others, which is of great importance when lithotrity is concerned, not only in an operative point of view, but also with respect to circumstances which may arise during the treatment. The dilatability of the canal is much restricted in some persons, and is very great in others, as shown by the little inconvenience occasioned when its capacity is enlarged by bougies, gradually increasing in size, and by the spontaneous passage of moderate sized calculous concretions with the urine. The junction of the lining membrane with the skin at the orifice, and the firm texture of the *glans penis* prevent much dilatation at this part, so that in performing lithotrity it is often necessary to incise the aperture with a small *bistourie caché* to admit the lithotrite, which then passes very readily along the rest of the canal. This little preliminary operation is of so trifling a nature, and occasions so little pain that the patient is often not aware that it has been done. On account of the narrowness and comparative rigidity of the orifice of the urethra, small calculi and fragments which have passed along the rest of the canal are frequently arrested near it. The presence of the unyielding texture of the prostate, especially when enlarged or indurated, also presents a great impediment to the dilatation of the part of the urethra which it encloses; hence, in children and young subjects in whom this gland has not attained its full development, there is a much greater dilatability of the neck of the bladder, which circumstance renders laceration, and, consequently, urinary infiltration of the cellular texture, less liable to occur on the extraction of calculi by perineal lithotomy than in individuals more advanced in life. The extent to which the female urethra admits of dilatation is also doubtless attributable, in great measure, to its not being enclosed within an unyielding substance analogous to the prostate.

The form and capacity of the bladder present great varieties in patients with stone, and must in many cases influence the choice of an operation. In general, the bladder in females is more capacious than in males, and more so in its lateral than in its antero-posterior diameter, in consequence of the pressure of the uterus and rectum from behind. Many patients have a capacious bladder and can retain a large quantity of urine; while in others it is much contracted, and the urine is expelled almost as soon as secreted; hence the relative size of the stone with respect to the capaciousness of the bladder, is often a consideration of greater importance than its absolute size, especially when it is the surgeon's intention to perform lithotrity. Thus a stone which might be regarded as small or of moderate size in a healthy bladder of ordinary capacity, would be comparatively large in the bladder of a child, or of a person who had suffered much from the disease; and the cavity of whose bladder had in consequence become diminished. The thickness or thinness of the parietes of this viscus will require to be taken into account, and also, whether these states preceded the formation of the stone, or arose from the irritation produced by its presence. When hypertrophy of the bladder is caused by the repeated contractions from the irritation of stone, its muscular fibres become exceedingly developed, and are sometimes collected in fasciculi, allowing the mucous membrane to protrude between them, forming pouches or herniæ, in which calculi may become lodged, and thus cause one of the most serious complications of the disease. Independently, however, of this cause, the mucous membrane of the bladder, instead of being smooth as in its natural state, is sometimes exceedingly irregular on its surface, forming projections or folds which render the detection of small stones or fragments a matter of great difficulty, and present an impediment to their being carried off with the urine. The Hunterian Museum contains a fine specimen of this state of bladder, the mucous membrane being in some parts exceedingly elongated. Mr Howship has also given in his work on the urinary organs, a representation of these folds of the bladder, extending transversely from one ureter to the other, and to the vesical orifice of the urethra, which state of the parts prevented the escape of the urine and caused the patient's death.

The vascular condition, and the degree of sensibility of the urethra and bladder, vary greatly in different individuals. In some persons very slight contact of a foreign body with the mucous lining of these parts induces bleeding, which occasionally occurs to a considerable extent from sounding, or even from the simple passage of a bougie. In most stone-patients, when the disease has existed for any length of time, the mucous membrane of the bladder is generally in a permanent state of congestion, and blood is not unfrequently effused from its capillary vessels, especially after exercise or other active bodily exertion. The parts in several individuals, though not exhibiting this tendency to bleeding, are yet so highly sensitive that the passage of an instrument along the urethra is attended with great pain, and is not unfrequently followed by fever, a state of nervous irritability, and other unpleasant consequences; while in some other persons the passage of the instrument into the bladder is scarcely felt, and does not occasion any inconvenience; hence, the chief reason why some suffer so severely from stone, while in other cases the patient is scarcely sensible of its presence, the disease often existing for a long period without giving rise to distinctive symptoms, and before its true nature is ascertained. This high degree of sensibility of the parts, caused by the contact of instruments, is often attendant only on the first few times of their introduction, and most frequently becomes diminished in proportion to the frequency of repetition; a circumstance highly advantageous as regards the repeated passage of the instrument in lithotrity; but this is not always the case, the reverse sometimes happening. The sensibility of the bladder is naturally the greatest about the internal orifice of the urethra, as evidenced by the acute pain occasioned by stones being pressed against this part during micturition. The urethra and bladder are more sensible in children than in adults; and in females, especially when of a nervous or irritable habit than in males; but on the approach of old age the sensibility of these parts becomes more obtused unless it be excited by any morbid cause. These organs, in common with other internal parts, appear to possess in many cases a certain degree of latent sensibility. Some individuals who do not at the time suffer much inconvenience from mechanical irritation, subsequently experience, after a longer or shorter pertod, pain and other symptoms of increased irritability, as is not unfrequently seen after sittings of lithotrity, or the passage of bougies along the urethra in persons unaccustomed to undergo these operations. There exists also great difference in the contractile power of the bladder in different subjects, though sometimes weakened in children, yet in young subjects and adults this power is in general pretty energetic, but often becomes materially diminished in advanced age, giving rise to various degrees of torpor or paralysis. The presence of stone or other disease of the bladder frequently increases its contractile power, but when of long standing sometimes produces an opposite effect. It is also at times more developed in particular parts of the bladder by an irritating cause, and these partial contractions of the bladder are not unfrequently extremely embarrassing in operations for the stone; preventing its seizure and extraction, and in some instances obliging the operator to discontinue the attempts.

III.—Of Lithotomy.

It would be foreign to the purpose to treat here at length of the different operations of lithotomy. I therefore purpose restricting my remarks to such points as have a more immediate reference to the subject under consideration; premising that they are intended to apply more especially to the operations by the perineum, as the recto-vesical and hypogastric operations, which have each at different times been advocated by surgeons of eminence, are at the present day comparatively rarely practised, and then only in some particular cases. The first of these operations, which was so strongly advocated by Vacca, who published several cases of success, was at one period, in consequence of his recommendations, adopted by several surgeons in various parts of Europe; and its advantages were much insisted on in France by M. Sanson, who performed it on several patients. In many of the cases, however, which were reported as successful, a fistulous communication became established between the bladder and rectum, embittering the patient's life; and the very frequent occurrence of this accident, which was almost always irremediable, more than counterbalanced the advantages of the operation in other respects, and induced even Vacca to abandon it; as I was informed when at Pisa, the residence of this distinguished surgeon, that, in the last years of his life, he almost always had recourse to the lateral operation. M. Sanson has also, I believe, given up his predilection for it.

The high operation has also been repeatedly recommended by great authorities, as possessing superior advantages over the perineal operation, viz. that it is easier of performance, does not require that the patient should be bound; that the textures divided are simpler and less in thickness; that there is but little risk of hemorrhage; that the bladder is cut into, at a part which is more free from irritation, while its neck and the prostate gland, which are so frequently the seat of irritation and morbid action, are spared; whereas, on the other hand, in the lateral operation, the difficulties experienced are often very great; blood-vessels of importance are not unfrequently divided, giving rise to serious bleeding; and even when the bladder is cut into, there is often great difficulty in extracting the stone, in consequence of the unyielding nature of the textures. Thus, as far as the mere performance is concerned, the high operation would appear to be the preferable method, but the great liability to infiltration of urine in the cellular texture, in the neighbourhood of the wound, is the great drawback to its more general adoption, and is the most frequent cause of failure. In fact, the bladder, from being cut into at its superior part, loses its natural tension, and collapses, while the urine having no outlet at the lower part by which to pass away as soon as secreted, (as in the lateral operation,) collects, and is thus continually in contact with the wound. Though this may, to a certain extent, be prevented by the introduction of catheters and other means, it is only partially so; for the contractile power of the bladder being more impaired by an incision at its upper part than at its neck, while that of the sphincter remains uninjured, the expulsion of the urine is rendered more difficult, even when assisted by artificial means. Another danger to which the high operation more particularly exposes, is inflammation of the peritoneum, from the contiguity of this membrane to the wound, which accident has been the occasion of death in numerous instances. These circumstances, and the unfavourable results that attended its performance a few years ago in some of the London hospitals, have caused this operation to be exclusively restricted in England to a few particular cases; and even in France its application is considered by the majority of practitioners as extremely limited, though a few still prefer it as a general method. Of these, M. Souberbielle is said to be one of the operators whose practice is attended with most success; but, according to some statistical returns, the average mortality among his patients would appear to be as large as one to between three and four, in persons at different periods of life.

The lateral operation, which is the one almost invariably performed in this country, is superseded in France in some cases by the bilateral operation, which has not, I believe, been performed in England, and of which, as it is less generally known, it may not be out of place to say a few words. Chaussier first conceived the idea of avoiding the consequences which result from an extensive incision or laceration of the cellular texture around the neck of the bladder, frequently attendant upon the extraction of calculi by the lateral operations, by incising both sides of the neck of the bladder, so as to admit the extraction of stones, even of large size, without the incision extending beyond the limits of the prostate gland, or, at all events, without extensive lesion of the surrounding cellular texture. Beclard also acted upon this idea, and performed the bilateral operation several times; but it is to Dupuytren that its introduction into practice was principally owing. This celebrated surgeon preferred it almost exclusively during the latter years of his life; and in consequence of the successful results which he was stated to have obtained, it was pretty generally adopted by many French surgeons. This operation is in fact a modification of Celsus' method of cutting upon the gripe, but, instead of the operator introducing his fingers into the rectum to fix the stone, a staff very much curved and deeply grooved is passed into the bladder; a semicircular incision is then made through the perineum, commencing midway between the tuberosity of the ischium and the anus at the right side, circumscribing this aperture, and passing an inch anterior to it, to terminate at the corresponding point on the left side; the membranous part of the urethra is then divided longitudinally, and the double-bladed *bistourie caché* is introduced along the groove of the staff into the bladder, its concave surface being directed towards the pubis; when within the bladder, the bistoury is turned round so as to make its concavity front the rectum; the blades then being pressed out (to the extent previously regulated by a scale at the handle varying from six to twenty lines,) and the instrument being withdrawn, an incision is made in the neck of the bladder and prostate, of a form corresponding to that of the integuments.

The chief advantages of this operation are, that it is better adapted to the easy extraction of large calculi, especially in cases of deep perineum, than is the lateral operation; a way being made for the passage of the stone at the widest part of the inferior aperture of the pelvis; and, as the incision at the neck of the bladder would not, in most cases, extend beyond the circumference of the prostate, the risk of urinary infiltration is much diminished. It exposes less than the lateral operation to the danger of wounding important arterial branches, though in the bilateral as in the lateral operation, considerable bleeding may ensue from the division of the veins about the neck of the bladder, especially in old persons; and this is, perhaps, more likely to occur by the former than the latter method, as they would be divided to a greater extent. On the other hand, there is perhaps more likelihood in this than in the lateral operation, of the rectum being wounded, as this part, particularly in old people, is often considerably dilated. This accident may, however, generally be prevented by the previous exhibition of an enema, and by the operator's depressing the bowel with the forefinger of his left hand, while making the incisions; but, even should it be cut, the wound would probably heal in most instances without trouble.

Some English surgeons, among whom is Mr Liston, recommend, when the stone is of large size, that the incisions through the integument and cellular texture should be made the same as in the lateral operation; and, if the incision of the neck of the bladder on the same side be found insufficient to allow the extraction of the stone, then to incise the prostate on the opposite side; thus combining the bilateral with the lateral operation. Where, however, the former appears to be indicated, I should conceive it would be be better to perform it in preference to the above method, in which the outward wound being on one side, the traction in the removal of the stone must necessarily be made in that direction, and when a large stone is in the grasp of the forceps, would be more likely to occasion injury and laceration of the parts, than when the direction of the outward incision corresponded with that at the neck of the bladder. Besides, the majority of operators having once seized the stone, would not stop to make the second incision of the prostate, but would continue their attempts to extract it, and thus risk injuring the parts by the employment of an undue degree of force. In several trials which I have made on the dead body, and also in the demonstrations of this operation which I gave in England, the blades of the bistoury were expanded to the extent of from fourteen to eighteen lines, which admitted of the extraction of large stones from the bladder, and subsequent examination of the parts showed that the incisions had not extended beyond the limits of the prostate.

It is now ascertained, however, that the bilateral operation was not so successful as it was at first represented to be, and that as a general method is much less eligible than the lateral operation. Indeed, it is greatly to be regretted that so little reliance can be placed upon the statements made by several continental practitioners, with respect to the results of particular methods of treating diseases. I should be sorry to ascribe this circumstance to improper motives, or to a desire to mislead; but the fact is too generally known by those who have seen much of continental practice, that many of the statements made, particularly by some members of the profession in Paris will not stand the test of inquiry. Thus, with respect to the operation in question, it is stated in the Dictionnaire de Medecine et Chirurgie, that, of about seventy patients on whom Dupuytren performed it in hospital and in private practice, only six died; while, on the other hand, M. Civiale states in his work already quoted, that, of thirty-two patients on whom this operation was performed by the same celebrated surgeon, eight died, three were incompletely cured, and only twenty-one were completely cured. A table, given in Dupuytren's large work on the bilateral operation, published after his death by his executors, also exhibits very different results from those in the Dictionnaire de Medecine, and may be considered as a fairer estimate of the average mortality from this operation, when skilfully performed. By this it appears that, of ninety-nine patients operated on, nineteen died, or nearly one in five. Of these patients about one-half were under twenty years of age, and no doubt, in a great number of these, there existed no organic lesions, and the stone was of small size; so that these individuals were under the most favourable circumstances for undergoing any of the operations of lithotomy.

The lateral operation may then be considered as the one most applicable to the great majority of cases where lithotomy is required, and must be regarded in a very different light according to the circumstances under which it is performed; both with respect to facility of execution, and as to its ultimate results. In favourable cases, and particularly in young subjects, the operation is generally terminated in a few minutes, not unfrequently in one or two minutes, and the patient is at once relieved of a disease, which, if left to itself, would occasion months or years of suffering, and cease only with his existence. After the operation, the wound in the bladder being at its lower part, the urine passes away readily; the contractile power of the organ is not materially impaired; there is comparatively little risk of the urinary infiltration or the peritoneal inflammation, to which the hypogastric operation so frequently exposes; and in by far the greatest number of instances, the patient advances towards recovery without impediment. Notwithstanding these circumstances, however, the operation must always be regarded as one of the most painful and dangerous in surgery; and, even when performed under the most favourable conditions, is fatal in a certain proportion of cases; while in the less favourable instances, the dangers are increased manifold; nor is there any operation which is at times so difficult of performance; where such unexpected circumstances may arise to embarrass the operator, or which is more likely to be followed by consequences productive of failure. Some of the principal causes of the greater difficulties and dangers attending the same operation in certain cases, may be here briefly enumerated.

One chief cause of increased difficulty in performing the lateral operation consists in the greater thickness of the soft parts to be divided between the skin and the bladder, depending upon the quantity of adipose matter; upon muscular and prostatic development, or a thickened state of the coats of the bladder. The depth of the perineum from one or a combination of these causes, is often so great as to prevent the operator's finger reaching the bladder, thus depriving him of the great advantage he obtains from the sense of touch when operating upon subjects under puberty, in consequence of which several lamentable instances are recorded of the bladder not having been opened, the cutting instrument having passed between it and the rectum, either in consequence of its slipping from the groove of the staff, or where this instrument has not been properly introduced into the bladder, but has rested on the prostate; this part and the neck of the bladder being thus only partially divided, and the gorget or knife having been pushed on, has entered the subjacent cellular texture, without penetrating into the bladder itself; or if an aperture has been made in this viscus, it has been too small to admit the blunt gorget or forceps, without the parts being lacerated and contused in the attempts. Hence arises in these cases the advantage of instruments which divide the neck of the bladder and prostate from within outwards, as the *bistourie caché.*

But even when a proper incision has been made into the bladder, the thickness of the perineum renders the seizure and extraction of the stone much more difficult, especially if there coexist induration and enlargement of the prostate gland, from behind which the stone cannot sometimes be dislodged; or if it be taken up by the forceps, and be not of small size, it frequently cannot be extracted without considerable effort, from the unyielding nature of the parts, thus risking laceration or contusion. Again, supposing the operation to have been performed, and the stone extracted without much difficulty, yet the depth of the perineum may be a cause of failure, in consequence of the great extent of surface of the wound exposed to the contact of the urine, producing, in some instances, extensive suppuration and sloughing of the cellular texture, which would be most likely to terminate fatally; especially if the patient had been previously in a bad state of health.

Another source of difficulty and danger, is where the stone is of large size, or if of moderate size, where the incision in the bladder is too small to admit of its extraction without the employment of force. From the employment of an undue degree of force in extracting the stone, there is more danger to be apprehended, than from any other cause, as when the parts are much injured in the attempts at extraction, the patient rarely survives.

In children and young men, however, when the efforts are made slowly and gently, the parts will generally admit of dilatation to some extent, and allow the passage of calculi, even of large size; but in many old persons, where the parts are indurated and rigid, they cannot be dilated, but would be lacerated by the operator's persisting in attempts to extract a stone disproportioned to the size of the wound. In similar cases it would be much preferable to enlarge the aperture by incising the prostate on the opposite side, than to risk the consequences likely to ensue from violence done to the parts. When, after this bilateral section of the neck of the bladder, the stone appears to be still too large to be extracted without risk of injuring the parts, it would be more advisable to break it either with the forceps or with a lithotritic instrument introduced by the wound, and to remove it piecemeal, than to exhaust the patient by forcible and unavailing efforts to extract it entire. Where, however, it is anticipated beforehand that the lateral operation would be attended with great difficulty, on account of the size of the stone, the bilateral operation would be more likely to be successful, for the reasons I have already stated.

Enlargement of the prostate gland is not only a source of difficulty, by its adding to the thickness of substance between the skin and the bladder, but also in the seizure of the stone by the forceps, especially when of small size, and lodged immediately behind this part. When there are several calculi in the bladder, though the operation is not necessarily more difficult of performance, there is always a greater degree of risk of one or more being undetected and left behind, particularly when the prostate is enlarged, and the perineum deep. In these cases, however, the great disposition to the formation of calculi must be taken into account, or the reputation of the operator would be frequently undeservedly compromised; as there is no doubt that in several of the cases where the surgeon has been blamed for having left a stone in the bladder; a fresh one has descended from the kidneys after the operation.

The occurrence of hemorrhage is an occasional cause of failure, and is one of the objections which have been most strongly urged against the lateral operation by professed lithotritists, and by the advocates of other methods of operating. A good deal of bleeding not unfrequently takes place, either at the time of the operation, or subsequent to it, and occasions considerable uneasiness to the operator, without any serious consequences supervening. When, however, it goes on to any great extent, it places the patient in imminent danger, though frequently more depends upon the state of the individual to support the loss of blood, than upon the quantity of blood lost. In many instances, the bleeding, to a certain extent, is beneficial, and the patient would, in all probability, be the worse, if it were to be checked by artificial means. Some persons are much more predisposed than others to hemorrhage, which may occur when the operation has been in every respect properly performed. In some individuals the arterial branches are unusually large; in others, again, they possess but little contractile power, especially in such as have been weakened, or worn out by long suffering, or whose general health has been deteriorated by other causes. When this is the case, the loss of a comparatively small quantity of blood might be fatal, which in a stronger individual would be of no consequence. Some persons, though enjoying good general health, and young children, cannot bear the loss of a comparatively small quantity of blood, without danger; hence the necessity of attending to the state of the patient, and to the peculiarities of each case with reference to the amount of bleeding, and the indications for interfering to arrest it.

Great skill in the performance of the operation is not always a guarantee against the wounding of such branches of the pudic artery as ought not to be implicated; as, in a certain proportion of instances, they do not pursue their regular distribution, and consequently may cross the line of incision, and thus give rise to fatal hemorrhage, as happened in a case where the late Mr Shaw was the operator.

Alarming and even fatal hemorrhage occasionally occurs from the plexus of veins around the neck of the bladder, which are often enlarged in old people. This kind is perhaps more to be apprehended than arterial hemorrhage, not only because it mostly occurs in diseased and debilitated subjects, but because it cannot be arrested, either by ligature or pressure, which may frequently be done when an arterial branch is divided. The plugging of the wound, which has been recommended, may, it is true, arrest the bleeding for a time; but this plan not only occasions an accumulation of coagulated blood, but also, by the irritation it produces, gives rise, in most cases, to inflammation and suppuration, with retention of urine, &c. and thus is more likely to do harm than good. Repeated injections of cold water, or of a solution of alum, afford perhaps the most effectual means of arresting, without inducing subsequent inconvenience, deep-seated hemorrhage, whether arterial or venous.

Another danger of the lateral operation, which has also been urged as an objection against it, is that of the rectum being wounded by the cutting instruments. This accident may, it is true, occur now and then, as when the stone is large and the instrument has to be reintroduced to enlarge the incision, or when the part is unusually dilated, which is not unfrequently the case, in persons whose bowels are habitually constipated. The importance of this accident appears, however, to have been exaggerated. There is no doubt that the rectum is sometimes wounded, without the circumstance being known, and the wound heals without inconvenience; for it by no means follows as a necessary consequence of this part being wounded, that the whole thickness of its coats should be cut through; and still less that a fistulous opening should remain.

After the incision has been made into the bladder, a source of difficulty not unfrequently arises to prevent the seizure of the stone and its extraction, from the forcible contraction of the bladder upon it, which the introduction of the forceps and attempts to find the stone tend to provoke. This impediment sometimes prolongs the operation considerably, and even occasionally prevents its completion; the danger being increased in proportion to the length of time occupied in the attempts, the patient being exhausted; and the parietes of the bladder bruised, and perhaps pinched or lacerated by the forceps. In these cases, by waiting a little while, the contractions of the bladder will often cease, and admit of the removal of the stone with facility; whereas, on the other hand, the repeated introduction of instruments, and the fruitless trials to seize the stone, when the surgeon is anxious to perform the operation quickly, without due regard to the difficulties he may encounter, will, in many cases, excite still more the contractility of the bladder, and thus prevent his attaining the desired object. Mr Crosse mentions in his work, a case where three-quarters of an hour were uselessly employed, in attempts with the forceps to find a stone, of the size of a pigeon's egg, which came out of itself, some time after they had been discontinued. This difficulty is sometimes experienced with respect to a small stone, upon which the bladder partially contracts, and which it encloses as in a cyst, thus preventing its being found, and leading to the belief of the operation having been performed when the bladder contained no stone; hence, the rule of never operating, unless the presence of the foreign body have been satisfactorily ascertained, by sounding immediately prior to the operation. To the same cause may be ascribed the occasional retention of a stone in the bladder, after one or more have been extracted. Dupuytren removed two calculi from a child by the bilateral operation; one of them was broken in the removal, and two fragments were retained in the bladder, one of which was subsequently extracted on the sixth day, and the other on the twelfth day after the operation.

Another not unfrequent source of failure, and of a fatal result after the lateral, as well as other operations for stone, is attributable to a diseased state of the urinary organs, or of other important viscera; or to such a deteriorated condition of the general health, as renders the patient unable to support the shock of so severe an operation. On this also, as well as on other accounts, the chances are greatly in favour of children and young persons, in whom the presence of the stone is most frequently the only disease; or if other disease coexist, it is often a consequence of the existence of the stone, and subsides after its removal; whereas in those advanced in life, organic alterations of the kidneys, bladder, or other organs very frequently precede the formation of the foreign body; so that in them, textures already in a diseased state are often cut through in the operation, which cannot fail materially to increase the probabilities of an unfavourable result. Where disease of the thoracic or abdominal viscera exists it is mostly counter-indicative of an operation; but organic changes in the kidneys are often obscure; cannot be ascertained beforehand, and only become manifest after the performance of the operation, when too late to be remedied. When a predisposition to disease exists in any particular organ, it may be called into activity by lithotomy, which is also liable to give rise to phlebitis and secondary visceral abscesses. These consequences, however, are common to all capital operations, and to accidents which impart a severe shock to the system.

In the enumeration of causes which have the greatest influence on the results of lithotomy, one circumstance must not be omitted, viz. the condition of the patient's mind, as regards the operation. There is no doubt, however well it may be concealed by some, that the impression on the patient's mind, for several days or weeks beforehand, that he is about to be subjected to one of the most dangerous and painful surgical operations, cannot but produce on many a most prejudicial effect; and is one of the reasons why lithotomy is so much more successful in children and young persons who are not aware of what they are to undergo, or, if aware of the nature of the operation, are more apprehensive of the pain it may occasion than of its ultimate result. Occasionally the shock on the nervous system is such, that patients die shortly after the operation in a state of collapse, and in those who entertain a strong idea that they will not recover, the anticipations of a fatal termination are often verified. Hence it is a matter of the greatest importance before operating, to endeavour to bring the patient to a fit state of mind to support the operation without entertaining an exaggerated idea of its dangers, or of his being in an unfavourable condition.

The most frequent causes of death after lithotomy are, in the young, the occurrence of convulsions, febrile irritation, with cystitis or peritonitis, and hemorrhage; in persons advanced in life, nervous irritability, inflammation of the bladder, kidneys, or other internal organs; infiltration of urine, with consequent suppuration and sloughing of the cellular texture, and arterial or venous hemorrhage. To some of these I shall have occasion again to advert, when considering the applicability of lithotomy or lithotrity, to particular cases.

I have subjoined in the Appendix some statistical accounts of the results of lithotomy, performed in different localities and at different periods of life.

IV.—Of Lithotrity

No operation of importance, at its first introduction into practice, was more favourably received by the majority of the profession in France than lithotrity, from the time that its practicability was demonstrated, by the successful results which attended its first applications to the living subject. Some of the more zealous of its advocates, however, desirous of having it considered as a means of at once superseding lithotomy in the majority of instances, not only applied it in cases to which it was but ill adapted, and thus occasioned accidents not unfrequently attended with a fatal termination, but also took every occasion of sounding its praises in the public journals and in medical societies; adducing successful cases in support of their arguments; while the unsuccessful ones were too often kept in the back-ground, whence they were brought forward by others, who took a different view of the question; among whom were several surgeons of eminence, who, though they expressed themselves not opposed to lithotrity in the abstract, but only to its too indiscriminate adoption, were, in their anxiety to refute the statements of their opponents, perhaps too ready to lay to the account of lithotrity itself, many unfortunate consequences attributable to the operation being performed in improper cases or in an improper manner. Nor is there any other instance of an operation, which, from having been for centuries considered impracticable, has made so rapid a progress within so short a period. Even so lately as the publication of Mr Crosse's standard work on Urinary Calculi, which obtained the Jacksonian prize five years ago, this distinguished surgeon thus expressed himself with respect to lithotrity. "The construction of instruments for this operation is so complicated, and so much delicacy and tact are needed for their safe employment on the living subject, that they are scarcely employed by any, save those who dedicate their time and attention almost exclusively to the undertaking."

The above passage refers, however, to the straight perforating instruments; this method of performing lithotrity being most generally known in England at the time Mr Crosse wrote; but the improvements which have subsequently taken place, by the introduction of curved instruments into practice, have so far simplified the operation, as to render it comparatively easy of performance by any surgeon of moderate dexterity, after having accustomed himself to the use of the instruments by trials on the dead body.

The idea of breaking down calculi in the urethra, and even in the bladder, with a view to their expulsion, appears to have been at different times entertained by individuals from a very early period. As, however, it is not my intention to enter into the historical details of lithotrity, I shall pass over the propositions of some of the older writers for performing this operation, and also the accounts of the work of Citeaux, Colonel Martin, and others,—who are said to have broken down, or filed away calculi within their bladders, previous to the present century,—in order to take a brief survey of the progress of lithotrity of late years, (without stopping to enumerate the various instruments which have been invented or proposed, and subsequently laid aside,)—before considering the advantages of the respective methods, and some of the consequences to which they may give rise.

The instrument proposed by Gruithuisen of Munich in 1813 was intended to seize and porforate calculi in the bladder, with a view of the more readily acting upon them by chemical solvents, and approaches nearest to the straight lithotrite of a more recent date. The merit of the invention of lithotrity, however, as methodically applicable to the living body, is unquestionably due to M. Civiale, who, unacquainted with the proposition of Gruithuisen, invented, so far back as 1817, an instrument intended to fix calculi in the bladder, while solvents were injected with a view of acting upon them; and although he shortly gave up the idea of dissolving calculi, his attention has been since almost unceasingly directed to the means of mechanically breaking them into portions, sufficiently small to pass away through the urethra. After various alterations in the construction of his instruments, he produced the three-branched lithotrite, with which the first operations on the living subject took place in 1823; and the following year, before the commissioners appointed by the Academie des Sciences, to examine and report upon the merits of the new method. The fortunate result of the cases, and the facility with which the operation was performed, induced the commission to make a report, most flattering to M. Civiale, and favourable to lithotrity, which from that period may be classed among the established operations in surgery.

The instruments of a somewhat similar form were at different times invented by some surgeons, especially MM. Amussat and Leroy, which were either not found to be applicable to the living body, or, having been used, were speedily laid aside; and Civiale's instrument continued to be almost exclusively used till about 1830, when two-branched instruments of a curved form were introduced into practice, by means of which some of the difficulties attendant upon lithotrity were removed, and the operation became more generally adopted by the profession, its performace having been previously restricted to a few persons.

The original idea of curved instruments to act upon urinary calculi appears to be due to Mr Elderton, of whose instrument there is a description in the Edinburgh Medical Journal in 1819. This was intended for the purpose of seizing the stone and filing it away, by a file passed along a groove in the superior branch. Sir A. Cooper's forceps for the extraction of calculi through the urethra, though not to be ranked among the lithotritic instruments, was of somewhat similar form, and was used for the first time on a patient in 1820. Four years later, a curved instrument, not very unlike the lithotrite of the present day, was constructed by Mr Weiss of the Strand, for the express purpose of breaking down calculi in the bladder, and was shown to Sir B. Brodie, who, however, considered its application unsafe, and it was consequently laid aside for some years. This instrument was subsequently shown to Baron Heurteloup, who is said to have taken from it the idea of his percussor. Be this as it may, Weiss's instrument acts by a screw, and the Baron is certainly entitled to the merit of introducing percussion into practice as a method of lithotrity. Another instrument of a curved form, acting entirely by pressure, and which was several times successfully employed, was invented by Mr Jacobson of Copenhagen.

The instruments employed of late years for breaking calculi in the bladder may then be ranked under four heads, *1st*, those with which the stone is first perforated with a view to diminish its force of cohesion, and then crushed; *2d*, instruments for breaking calculi by means of percussion; *3d*, those for effecting the same purpose by pressure; and *4th*, instruments by means of which percussion may be combined with pressure.

The instruments for perforating a stone in the bladder must necessarily be straight. Many persons, however, supposed till lately that the introduction of straight sounds into the male bladder was impracticable, or at least attended with great difficulty; but it is now generally known that straight instruments may be passed into the bladder in most cases, with nearly the same facility as curved ones. The three-branched instrument of M. Civiale is the only one of this kind applicable to the living subject; but, as it is now superseded by others, I need not enter into a description of it, or of this method of operating, which is at present scarcely ever employed, even by M. Civiale himself.

The kind of instrument used by Baron Heurteloup was constructed exclusively for breaking calculi by percussion. The original percussor was of large size, clumsy and formidable in appearance, and usually required the previous dilatation of the urethra, which is now dispensed with, except in some particular cases. It is not unlike a metallic sound, but the curve is shorter and more abrupt. It consists of two branches, the one sliding within the other, so as to allow a separation between the extremities about three inches in extent. The teeth are very large, and on the same level on each branch, from which it results that the intervening spaces are considerably weaker. The more modern instruments, however, are much smaller in diameter, combine strength with lightness, and the arrangement of the teeth is such as to afford an equal degree of strength throughout. A percussor without teeth is also not unfrequently employed by Baron Heurteloup, especially when attacking small calculi or fragments.

A part of the apparatus formerly considered indispensable for this operation, is the rectangular bed, proposed by the Baron, by means of which the patient's pelvis may be raised above the level of his shoulders, in order that the stone may fall by its own weight to the most favourable part of the bladder for being seized. After the stone is in the grasp of the percussor, the bed also serves to fix the instrument firmly, and thus prevent the shock of the blows from the hammer from affecting the parietes of the bladder. This is effected by an iron appendage fixed to the end of the bed, the branches of which being approximated by a screw, hold the percussor between them, as in a vice.

In performing the operation, the patient is fixed upon the bed in a proper position, and a moderate quantity of fluid is injected through a silver catheter into the bladder. The percussor is then introduced, and the stone seized. The instrument is then fixed to the bed, and the operator holding it in his left hand, strikes its extremity with a small hammer, till the stone is felt to be broken, when the percussor is removed from the vice in order to take up the fragments, which are broken in a similar manner, either during the same or at subsequent sittings.

The rectangular bed is, however, at present scarcely ever used, except by the Baron himself, as its disadvantages were found by others to more than counterbalance its supposed advantages. Not to speak of the impossibility of obtaining it, except in large towns, and of the inconvenience of having a similar piece of furniture transported to the residence of patients, it tends to complicate the operation, and would in many cases, by its formidable appearance, have a most prejudicial effect on the patient's *morale.* It has, moreover, the serious disadvantage of being liable to cause injury to the bladder, either by the movements of the patient, or by the contraction of this organ forcing its parietes against the extremity of the instrument, which, when fixed to the bed, cannot of course yield. In fact, in such a case, the patient is as it were hooked on to the operating table by his bladder ; and though those who advocate this method of operating represent in engravings the extremity of the percussor holding the stone in the bladder, in the centre of the fluid that has been injected, and consequently far from its parietes; yet those who have seen much of lithotrity are well aware that frequently only a small quantity of fluid can be introduced, either from the capacity of the bladder being diminished, or from the muscular contractions of this viscus, and also, that, from the last mentioned cause, a great part of the fluid injected is often expelled during the operation.

Most operators, therefore, even when employing percussion, prefer a common bed or sofa, and raising the pelvis by firm pillows placed beneath it. After the stone is seized, the instrument is held firmly in the operator's left hand, or, if sharper blows are required, it may be held by an assistant with a handle constructed for the purpose, which will be sufficient to prevent the shocks affecting the bladder; at the same time the operator will be better able to ascertain the degree of resistance when contraction of the organ occurs.

Of the instruments which have been used for crushing calculi exclusively by pressure, I need only mention that of Mr Jacobson, without, however, entering into a description of it, as it possesses no material advantage over the more modern instruments which have superseded its use.

The instruments with which pressure may be combined with percussion are most usually employed at the present day, and are so perfectly constructed as to render their use much more easy and safe, in all the cases to which lithotrity is adapted. In form they resemble Heurteloup's percussor, of which they may be considered a modification; and though their diameter need not exceed that of a large-sized bougie, they are made sufficiently strong to break the hardest urinary calculi. The concave branch slides freely within the convex one; and thus admits of the employment of percussion, while by the addition of a screw at the handle, (acting by a fly in Weiss's, and by turning a button in Charriere's instruments) pressure may be applied. (See Plate I. Fig. 1 and 2.) The teeth are small in these instruments, and are close together; the extremities of the branches are therefore as strong at one point as at another; the force employed telling in great measure on the curve and straight part of the instrument. An important improvement has been effected within the last three or four years by Mr Weiss, at the suggestion of Mr Oldham, by which a serious inconvenience formerly attending the use of these instruments is obviated. This consists of an opening being made in the curved portion of the convex branch, which, without weakening the instrument, allows of the detritus being pressed through, as the stone is crushed, instead of becoming collected between and clogging the branches,—thus impeding their closure, and the consequent withdrawal of the instrument, which not frequently occurred before this improvement was made. In the curved instruments, however, used by

M. Civiale, there is no aperture for the passage of the detritus, which is prevented from collecting between the branches, by a few gentle taps being struck with a hammer on the extremity of the concave branch after the stone has been crushed by pressure. After every two or three blows, M. Civiale separates the branches a little with the thumb of his left hand while holding the instrument, in order to allow the detritus to fall out; and in several operations which I have seen him perform, there has not been any difficulty in withdrawing it, though this would be very likely to happen in less practised hands. The extremity of the branches of this instrument is of a much more flattened form than those in general use, which M. Civiale considers more advantageous, as a larger surface of the stone is embraced, and the fragments resulting from its fracture are less angular.

After a stone has been broken by one of the preceding methods, a greater difficulty is generally experienced in dealing with the fragments, each portion having to be seized, and broken sufficiently small to enable it to pass away through the urethra. In order to obviate this inconvenience, Mr Key very ingeniously caused to be added to the ordinary kind of lithotrite, a small net, which, when the instrument is open, is expanded by means of lateral wires. The net thus catches the larger fragments after the stone is crushed, instead of allowing them to fall into the bladder, and, being contracted by drawing the wires, replaces them within the grasp of the instrument, to be broken into small portions at one sitting. Though this apparatus has been successfully used by Mr Key, it is of too complicated a nature, and too likely to become deranged, and thus cause irremediable injury, ever to come into more general use. Even were it not exposed to these objections, it has, moreover, the great disadvantage of not allowing the surgeon to discontinue the operation, before the whole of the fragments are broken into pieces sufficiently small to pass through the meshes of the net, whatever be the state of the patient or the irritability of the parts; and it is well known by those who have paid most attention to the subject, that many of the accidents and dangers attendant on lithotrity are attributable to the sittings being too much prolonged, when the surgeon has been anxious to terminate the operation in one or two sittings.

There is in general no difficulty in seizing a stone in the bladder with the two-branched lithotrite, after a few trials have been made on the dead body. The pelvis having been raised by pillows placed beneath it, and the bladder moderately distended by the injection of tepid water, the lithotrite should be introduced and the stone felt for with its convex surface as in common sounding. By raising the handle, and consequently depressing the curved portion of the instrument to the floor of the bladder, the stone will generally be pushed a little on one side. The lithotrite being then held steadily with the left hand, its concave branch should be drawn back with the right, and as the resistance is withdrawn, the stone, tending to revert to the medial line, will probably fall within the expanded branches. When the curved portion is not sufficiently depressed, though the stone be plainly felt, the attempt to seize it may fail, in consequence of the instrument being opened above it, as I have seen happen in several instances. If the stone should not fall within the branches, and is felt to lie on one side, it may generally be seized by rotating the beak of the instrument towards it, and even when lying behind an enlarged prostate, a stone may frequently be taken up by this means. As the shortness of the curve in these instruments admits of their being turned completely round, with but little pain or inconvenience, on the concave surface being presented downwards, and the inner branch being drawn back so as to open the instrument, the prostate is slightly advanced with it, thus very much facilitating the taking up of calculi, which would otherwise escape detection. When the stone is felt to be between the branches, it should be held firmly by the thumb of the operator's left hand pressing on the expanded portion of the handle, if percussion is to be employed, or by turning the fly or button when pressure is preferred; the screw being then tightened till the stone is broken, or, if much force be requisite, and the assistance of percussion be deemed advisable, the screw may be removed by turning the knobs of the button in one of Charriere's instruments transversely, (see Plate I. Fig. 2) and a few sharp blows struck with a hammer on the extremity of the instrument. When the stone is broken or is felt to have yielded, the screw may be again applied, and the branches of the instrument brought into contact with each other. In most cases, however, percussion may be dispensed with altogether, and in many a very slight degree of pressure by means of the screw suffices to reduce the stone to fragments. This method is considered by most unprejudiced persons conversant with the subject as infinitely preferable to percussion, as it is not so formidable an operation; is less abrupt in its action; does not require the assistance of a second person; is attended with less risk of injury to the parts, and breaks many calculi by gradually crumbling them down to a coarse powder or to small fragments, instead of at once dividing them into two or three larger portions, as mostly happens by percussion, which should be especially avoided when the bladder is much contracted, or where there is great irritability of the parts; but where the stone is hard and brittle, not yielding readily to pressure, percussion may be advantageously called in to its aid, and will in some cases very much facilitate the operation. When the stone is once broken its fragments may generally be reduced to smaller portions by pressure alone; for which purpose it is frequently not even necessary to employ the screw, pushing the ends of the branches against each other with the hand being sufficient. For this part of the operation, as also for crushing small stones, the screw scoop and catheter forceps, (see Plate I. Fig. 4 and 5), constructed by Weiss, may often supersede the employment of the lithotrite. These instruments are also well calculated to remove small fragments or detritus lodged behind the prostate. Injections of the bladder, either through the last named instrument, or through a large silver catheter, constructed for the purpose, the eyes of which are of considerable diameter, will also very much facilitate the expulsion of detritus.

In favourable cases, after a sitting of lithotrity, the patient usually experiences some pain or uneasiness for a few hours, or a day or two, passes a little blood and some fragments or detritus with the urine. He is not necessarily confined to his bed during the treatment, and in many cases may attend to his usual avocations. Some patients have even walked to the operator's house and home again after the sitting is over, experiencing no further inconvenience than the passage of a bougie would occasion in others. In most persons the first sittings (supposing several to be necessary) are the most painful and more likely to be followed by unpleasant consequences, the subsequent sittings being generally attended with less inconvenience, as the parts become more accustomed to the stimulus of the instrumental manœuvres, and as the size of the foreign body becomes diminished. In some cases, however, the progress towards a favourable termination is retarded by the occurrence of one or other of the accidents which may ensue during the treatment, rendering the result doubtful, and which at an earlier period was so frequently a cause of failure.

I shall here briefly notice the accidents most likely to occur, even when lithotrity has been properly performed, and in suitable cases. It is not uncommon after a sitting of lithotrity, especially if it have been too much prolonged, for a degree of inflammation of the urethra, attended with discharge, to occur, as sometimes happens even from the mere passage of a bougie or sound. By rest, however, attention to diet, the use of diluents, &c. it mostly subsides in a few days, and is attended with no further inconvenience than that of occasioning the suspension of the operation. The same may be said of inflammation of the testicles, which also sometimes occurs, especially if they be not properly supported. A slight degree of fever very commonly attends the first sittings of lithotrity, but usually subsides within twenty-four hours. In some instances, however, it may continue for a longer period, and may even run high or assume an intermitting character, being sometimes accompanied with alarming symptoms of nervous irritability. These accidents are not necessarily in proportion to the severity and difficulties of the operation; but they may also occur when the sitting has been attended with but little pain, and when the stone has been easily broken, especially if, from the comparative freedom from pain, the surgeon has been induced to prolong the sitting by attempting to do too much at once. Other accidents to which lithotrity may give rise, are bleeding from the urethra or bladder, (though seldom to an extent productive of much inconvenience;) pain at the neck of the bladder with irritability of the organ; inflammation of the prostate and abscess, which may cause retention of urine. These are sometimes attributable to the strain on the parts in consequence of the urethra being forcibly straightened by the introduction of and manœuvres with a straight inflexible instrument, and hence are more liable to happen when the curve of the urethra is naturally greater than usual, or when it has become so from enlargement of the middle lobe of the prostate.

Another serious accident peculiar to lithotrity, and of more frequent occurrence, is the arrest of fragments in some part of the urethra. The portion of this canal enclosed by the *glans penis* being generally narrower than other parts, fragments which have been expelled as far as the *fossa navicularis*, are frequently arrested at this point, whence they may generally be removed by a blunt hook passed behind them, or by crushing them with a forceps constructed for the purpose. When, however, this cannot be effected, the incision of the orifice of the urethra with the uretotome will be necessary; indeed, as I have before stated, this incision is sometimes required previous to the operation, in order to admit the lithotrite. Other parts of the urethra at which portions of calculi are most likely to be arrested, are the point opposite the bulb, and the membranous part where the canal is narrowed by the suspensory ligament. By introducing a straight full-sized bougie or sound as far as the obstacle, the fragment will in many cases be expelled on the patient's endeavouring to make water as soon as the instrument is withdrawn. Should this not succeed, the fragment may generally be pushed back into the bladder, to be broken at a subsequent sitting. Of the instruments invented for breaking calculi or fragments in the urethra, when they can neither be expelled nor pushed back into the bladder, the ingenious one lately constructed by Mr Weiss appears well calculated for the purpose. It consists of two elastic blades enclosed within a canula. When the canula is drawn back the blades open by their own elasticity, and separate the parietes of the urethra, enabling the operator the more readily to pass them on either side of the fragment which is thus fixed between them by advancing the canula, and is broken down by rotating a central rod with a head resembling the perforator in Civiale's three-branched instrument. (See Plate I. Fig. 6.)

The stoppage of fragments in the urethra, and the consequent dangers to which it gives rise, are fortunately of less frequent occurrence in those persons who are most likely to be subjected to lithotrity, viz. adults and persons advanced in life, than they would be in young subjects, in whom the urethra is very narrow; while, from the comparative absence of resistance in the textures, the neck of the bladder is more dilatable; yet, notwithstanding, it is more common than the other accidents which occasionally ensue.

Retention of urine sometimes supervenes upon a sitting of lithotrity, either from the irritation caused by the arrest of fragments in the urethra; from this passage being obstructed by coagulated blood; from spasmodic action at the neck of the bladder; from atony of the organ, or enlargement of the prostate gland; but it mostly admits of being removed by the catheter, or by the employment of antiphlogistic and sedative remedies.

A high degree of irritability of the bladder, marked by frequent desire to make water, increase of the pain, and other symptoms, is occasionally induced by lithotrity. This may go on to inflammation, attended with great constitutional irritation, and a copious secretion of mucus, and is most likely to occur in young subjects, or in those of an irritable habit, where the sittings have been too much lengthened, or where the stone is exceedingly hard, or of large size, requiring many sittings for its removal. The presence of sharp angular fragments of some kinds of calculi is also a cause of cystitis in some cases. Cystitis is the most formidable accident to which lithotrity may give rise, and the most likely to prove fatal. A degree of chronic inflammation, however, accompanied with discharge of mucus, but without pain or much constitutional disturbance, is not unfrequent, and subsides after a short time by repose, and the use of appropriate remedies. In some cases where a state of chronic inflammation, with copious secretion of mucus, had previously existed, the discharge has diminished, and the inflammation has subsided, during the treatment, after a few sittings of lithotrity, probably in consequence of the bulk of the foreign body being lessened; but, whatever be the cause, experience has shown that this result not unfrequently occurs.

The irritation caused by lithotrity sometimes extends to the kidneys, producing pain in the lumbar region, bloody urine, and other symptoms of these organs being affected. When there is reason to believe in the existence of a diseased state of the kidneys, previous to operating, the sittings should be very short, and repeated at longer intervals, after all irritation has subsided. Pressure should be employed to break the stone in preference to percussion, and the patient should be restricted to repose, a bland diet, and the use of mucilaginous drinks, and tepid baths, as should also be the case whenever there is reason to apprehend the supervention of any of the preceding accidents.

Thus we see, that while in some cases lithotrity will relieve a patient from his disease in one, two, or three sittings, with but little pain or interruption of his ordinary avocations, yet that in others, this operation, even though it may terminate successfully, is attended with considerable pain, requires many sittings before the stone is got rid of, obliges the patient to confine himself to his room, or to bed during the treatment, and is liable to induce one or more of the accidents which I have enumerated. As, however, lithotrity is every year making greater progress towards perfection, we may reasonably indulge the hope that the sphere of its application will become more extended ; and that, as the cases to which it is adapted come to be better discriminated, the accidents to which it exposes will be proportionately diminished.

Having in the preceding remarks touched upon some points of practical interest connected with lithotomy and lithotrity, and having briefly noticed the advantages and inconveniences of the different methods of performing these operations, I next proceed to the inquiry as to the cases in which the one or other operation is most applicable.

(To be continued.)

ART. III.—*Amaurosis from Hysteria, acute and chronic, its Diagnosis, Pathology, and Treatment.* By EDWARD HOCKEN, M. D., M. R. C. S. L.

I purpose, in the present paper, to give a detailed account of this subject, many remarks on which have already been published in separate articles, at different periods.* It will be necessary for me, in the first place, to define my views of the nature of hysteria itself, since on the publication of my paper on hysterical amaurosis, in the Lancet for August 15th 1840, Mr Middlemore seemed to consider my description, in the female subject, as synonymous with uterine irritation. As the imperfection of vision, and the other peculiar symptoms I am about to describe, occur only in individuals of an hysterical constitution, and these phenomena never occur under other circumstances, they deserve, in my estimation, the specific title of hysterical amaurosis. Mr Middlemore, referring to the paper already mentioned, says,—" Disorders of the stomach and uterus, &c. constitute a fertile source of amaurotic affections, and which are for the most part manageable by suitable treatment. The important question is, are there any given set of outward and visible signs, by which any given form of uterine amaurosis can be distinguished from any given form of gastric amaurosis ? and if so, what are they ?" In the course of this paper, I will answer each and all of these questions separately, and I trust satisfactorily.

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* Vide Author's papers, Lancet, Vol. i. 1839–40, pp. 496–7; Vol. ii. p. 751, &c.; Vol. ii. 1840–41, p. 7, &c.

We may define hysteria to consist of such a condition of the general nervous system, original or acquired, as renders it capable of simulating most local diseases, of complicating them in their progress, and modifying them in their usual phenomena, or the general nervous system itself may be the theatre of its operations, being then attended with general convulsions, and complicated with symptoms derived from the impeded performance of the functions of particular organs: the condition of the nervous system in its two extremes, varying from mere increased excitability and mobility to complete coma or catalepsy. Affections of an hysterical character are usually marked by great and sudden changes in the display of the mind's affections and sensibilities, by tears and laughter, by anger and joy, despair and hope; by a copious flow of limpid urine, nearly colourless, borborygmi and flatulence, the sense of a globular body rising from the abdomen to the throat (globus), with feelings of suffocation, and a circumscribed pain in the temple, severe in character, denominated clavus. The constitutional and local phenomena most frequently occur in females shortly after puberty, being rarer in the adult, rarely, but still occasionally, seen in the male.

Such I believe to be a sufficiently wide definition—a definition which alludes especially to four particulars: 1*st*, that hysteria occurs only in a particular condition of constitution; 2*d*, that this constitutional affection varies from mere nervousness to the most exaggerated effects of a suffering nervous system; 3*d*, that it is not necessarily connected with any local disturbance, although such affections usually bear the relation of exciting or predisposing causes; 4*th*, that the uterus has obviously no especial and inseparable connection with hysteria, as the name would seem to imply, since it may occur in the male; whilst females suffer in greater proportion only, because naturally more delicate and excitable. We find Sydenham, in speaking of hysteria, saying:—Quinimmo non pauci ex iis viris qui vitam degentes solitariam, chartis solent impallescere, eodem morbo tentantur."

Hysteria obviously commences in that condition of the general nervous system, usually denominated nervousness, being the first link in that chain of nervous maladies which may reach to so great a length. Any hysterical phenomenon may be developed in such individuals, who have, perhaps, previously never shown any other indications of this constitution than nervous excitability, with copious flows of clear and colourless urine, great irascibility of temper, and fickleness of disposition. Although in females we usually find the uterine and digestive functions deranged and depraved, either of them predisposing, or calling the symptoms into active play, yet neither of them are necessary to its existence, for we find that the changes effected at puberty may be sufficient alone to produce the disease, or sufficient when acting on an original and predisposing condition of the nervous system. I insist on these points, from the fact that some authors treat the term as synonymous with uterine disease (chronic hysteritis). Thus Dr Billing remarks that the term hysteria is not only applicable to aggravated cases, but to those slighter cases where the derangement in the uterus is latent, (p. 147). Again he remarks, at p. 273, that hysteria may be so slight, that scarcely any, if any, discoverable irregularity or derangement of the functions of the uterus is evident.*

The number of derangements and diseases, which hysteria is capable of simulating, really appears wonderful, although rarely with such exactness, but as to present many anomalous complications which have no proper connection with the simulated affection ; and hence from these, and from other local and general symptoms peculiar to itself, it is, in general, readily diagnosced, its symptoms dissected, and feigned diseases traced to their proper source. Imperfection of vision is among the number of these derangements, which may be slight in kind, and transitory in duration or very severe, sometimes tardy in its progress, and prolonged in its existence. I will commence my description with an account of the acute form of amaurosis from hysteria.

Acute Form.—The amaurosis from hysteria may occur as an acute as well as a chronic affection ; and, under these circumstances, we find almost invariably that derangements in the *primæ viæ* of an acute or chronic character, have proved the immediate exciting causes, aided or called into action by mental excitement, slight bodily injury, or fright. In these acute attacks, we almost invariably meet with anomalous head symptoms, which precede and accompany the development and course of the amaurotic symptoms; and in a case† which I saw from its commencement to its termination, many other local phenomena of a distinctly nervous character appeared and disappeared suddenly during its progress. This is one of the peculiarities of such cases; namely, that the symptoms come on with an intensity and hurry never marked in common inflammations; they alternate in character, disappear, or are alleviated most rapidly from improvement in the condition of the *primæ viæ*, or the complete correction of the existing condition.

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* Vide Principles of Medicine, edit. 4th.

† Lancet, Vol. i. 1839-40, p. 496.

In the case to which I have just alluded, the amaurotic confusion and distress of vision came on in connection with severe head symptoms, and a deranged condition of the abdominal viscera; this, with the other painful and deceptive phenomena, readily yielded to remedies by which the intestinal canal was mildly, but efficiently cleared out, the nervous system calmed, and the local abdominal irritation relieved.

Case I.—A tall, thin, and delicate female, of the name of Scanes, who had suffered previously from hysteria, was attacked at about the seventh month of pregnancy, from some slight and apparently inadequate exciting causes, with the severe symptoms about to be described.

During the whole period of pregnancy, which preceded the attack, she suffered severely from disturbed digestion, and abdominal irritation; there was frequent vomiting of undigested ingesta, pain in the hypochondriac region, not increased on pressure, colicky pains in the abdomen, and the bowels alternately confined and affected with diarrhœa; the excretions being always vitiated, and usually of a dark colour.

At a period when the bowels were obstinately confined, about the seventh month of utero-gestation, she received a slight shock from tripping over the last stair in her descent, and was still farther excited in the afternoon of the same day by quarrelling with her husband. Under these circumstances, she was attacked with a severe rigor, followed by heat of skin, a rapid jerking but soft and feeble pulse, thirst and dryness of the throat; there was the most violent cephalalgia, of a pulsating kind, especially complained of over the brows; intolerance of light and amaurosis, the sight being imperfect, confused, and dazzling, and she was impatient of even the slightest noise; but the countenance was collapsed and pale, and she complained of sensations of syncope and vertigo on being raised into the erect posture; the abdomen was distended and slightly painful; the urine pale and abundant; the tongue moist, but thickly coated with a brownish slimy fur; the respiration accelerated, and the breath highly offensive.

Soon after the development of these symptoms, the pain in the abdomen was greatly increased; the most exquisite tenderness supervened; she could not bear the weight of the bed-clothes, and the slightest touch was answered by a loud scream; but the tenderness on pressure was peculiar. She complained most loudly almost before the hand fairly reached the surface of the abdominal parietes, and firm pressure rather diminished than increased the pain. The abdominal pain extended down the thigh, at the inner and posterior part, in the course of the sciatic nerve; and this added not inconsiderably to the patient's distress. With the accession of these symptoms, the head was in some measure relieved, the pulse continuing very compressible and rapid, and attended by a distinct jerk; the bowels still obstinately confined, and the urine limpid and colourless, discharged in large quantities.

From a knowledge of the patient's previous condition, the present intestinal derangement, and the peculiarity of the other symptoms, its nature was at once suspected. A dose of fifteen grains of rhubarb, with five of calomel, and a similar quantity of some aromatic powder, was administered immediately, and an injection, containing half an ounce of the *oleum terebinthinæ purificatum*, with half-a-drachm of *liq. opii sedat.*, and a sufficiency of the *decoct. hord.* The results of their combined operation was most satisfactory; a large quantity of highly offensive dark-coloured feculent matter, containing scybalous masses, was speedily evacuated, and with almost immediate relief to the most pressing symptoms. On visiting her the next morning, she complained only of slight headach, and of a pain extending down the sciatic nerve, symptoms which were speedily removed by subsequent treatment. By careful attention to her general health, and the condition of the alimentary canal, she quickly and perfectly recovered, and gave birth to a healthy fœtus at the full time.

Remarks.—In hysterical females, I have several times seen attacks of this nature, but much less severe; and in all the characteristic phenomena were similar, yielding as suddenly as the commencement was abrupt, and always manifesting great derangement in the alimentary canal. In every case where imperfection of vision existed, it was of the same kind,—imperfection and confusion, with intolerance of light; and although it may disappear and recur, it has never been of any long duration. A well-marked case of this kind is also narrated by Mr Dorrington of Manchester in the Medical Gazette, (Vol. ii. 1839–40, p. 838.)

The affection commenced by a "queer" sensation about the head, attended by confused and deranged vision; this was on the 21st of February 1840. Mr Dorrington commences by saying, that he was summoned on this day to a lady aged 30, about to have a fit, who had suffered severely from hysteria for a twelvemonth previously. On his arrival, he was informed that she had been seized with a queer sensation about the head, and the following derangement of vision: when she looked with both eyes at objects, they seemed inverted and misty; but when she closed either eye, she could see naturally and clearly with the other. Her face slightly flushed; her pulse 98; she had no pain, but a confused feeling in her head. All these symptoms had supervened suddenly whilst sewing. On inquiry, the bowels were found to have been constipated for two or three days. Whilst Mr Dorrington remained, the vision was restored to its natural state, and the feeling of confusion in the head left her. An antispasmodic draught and purgative were prescribed.

22d. The derangement of vision had returned: *haust. opii rep.* In the evening when she looked with both eyes, she saw an object and a-half dimly; with either eye separately, she saw correctly but not distinct. The confusion in the head existed; eyes natural; irides acted perfectly. She remained in this condition two days, the bowels being very confined, although active purgatives were administered. 25th. Could see near but not distant objects; bowels acted upon pretty freely, and a considerable quantity of solid feces being evacuated. On the 26th she was discharged with but slight dimness of sight, which quickly disappeared. Subsequent to this period, she suffered severely from hysteria. Mr Dorrington remarks, that the overloaded state of the large intestines, so common in hysteria; the curious morbid changes of sight that occurred; the suddenness of the attack; the intervals of natural vision that occasionally existed during its continuance, and the restoration of the healthy functions of the retinæ, when the bowels were unloaded, combined with the former history of the patient's illness, and her subsequent attack, seem distinctly to point to hysteria as the cause of her anomalous symptoms. By the bye, I may remark, that Mr Dorrington does not allude to any intolerance of light,—a symptom I have never seen absent in these cases. We find, also, somewhat similar cases excited by blows on the head, detailed by Messrs Abernethy, Tyrrell, &c., and cured by tonics and antispasmodics.[*]

A young and delicate female, about 17 years of age, having great nervous susceptibility, and disposed to hysteria, was accidentally thrown from a gig with her father. She fell on her father, and was taken up without any mark of injury. She was greatly alarmed, and shortly after attacked with a violent fit of hysteria, several hours elapsing before she could be aroused from this. She then complained of excessive headach, with giddiness and confused vision, and heat of head; the stomach was irritable; she suffered from great mental depression, and could not procure sleep. Her medical attendant now bled her, and she fainted from the loss of eight ounces, continuing long in a condition of leipothymia. All her symptoms were much aggravated a few hours afterwards; she was completely blind forty-eight hours after. She was now taken to Mr Tyrrell, who directed quiet, the horizontal posture, and the *vinum ferri,* with an occasional tonic and antispasmodic aperient. Under this treatment, she began to perceive light in about forty-eight hours, and gradually recovered health, the return of the functions of the retinæ being more gradual. She suffered a relapse several months after from the distress occasioned by her father's failure in business, from which the most careful treatment failed to recover her completely.

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[*] Tyrrell's Treat. Vol. ii. p. 296.

Mr Tyrrell narrates this as a case dependent on anæmia, and as a good illustration of the difficulty in diagnosis from injury of the brain from accident. My own opinion is, that it was primarily a case of acute hysterical amaurosis, increased and aggravated by loss of blood.

Mr Abernethy remarks* that, in nervous patients, cases of actual concussion, occasioning insensibility, are frequently followed by nervous pains in the head, &c. He proves these remarks by a case in which a young lady, who went out of London for the improvement of her health, was stunned by the upsetting of a gig in which she was taking exercise, from being unable to walk from a "kind of rheumatic affection of her ankle" (neuralgic or hysterical ?). She became quite blind on the fifth day after the accident. Mr Abernethy recommended that the case should be treated as one of nervous blindness. Under this treatment the patient gradually, and even speedily regained her health and sight.

Mr Howship † remarks, that he was requested to see Mrs W. aged 34, who had been, for several days, suffering from strange feelings in her head and limbs ; the sight much affected, and at intervals totally lost. The limbs, she said, felt queer and numb, not painful. We found the room darkened, yet with the one eye she could see nothing, and with the other, only perceive light indistinctly. There was no trace of inflammation, or external congestion about the eyes ; yet, when closed, she saw the appearance of a ball of fire, like the sun, with luminous objects, frequently moving. Sounds were distressing ; skin pale and cool ; pulse small, soft, and quiet.

A blister to the neck, leeches to the temples, the bowels having been previously cleared, with two grains of *pil. hyd.* and a quarter of opium every four hours, were directed. The chamber to be kept warm.

By the next day greatly altered ; she could see tolerably well with one eye, and partially with the other ; head much better, but complained of an unpleasant taste in the mouth. This treatment continued for a few days, was productive of complete relief to all her complaints. Perfect recovery of sight, feeling, and power in body and limbs ensued, with complete restoration of the intellectual faculties, which she now became aware were so impaired, that she admitted she neither properly knew nor cared for anything said or done. Subsequently an opportunity was sought for cautiously glancing at the state of her mind ; she instantly burst into a flood of tears, sufficiently confirming its dependence on mental distress.

This is a clear case of amaurosis from the condition of the general nervous system, and I do not think that Mr Howship used much "discrimination" in describing it as an "extreme congestion, producing sudden loss of vision."

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* Injuries of the Head, &c. p. 89. Fourth edition.

† On Surgical Disease, p. 24.

I am enabled to add the particulars of a case, which I ascertained myself, and which occurred under the care of Dr Latham, in St Bartholomew's Hospital. It was kindly pointed out to me by my friend, Mr Ormerod Junior.

A middle-aged female was, some time since, admitted into the hospital, suffering from acute rheumatism, in the course of which the endocardium became inflamed. This attack was subdued by appropriate remedial measures. This same patient was again readmitted during the present season (1840–41), complaining of anomalous pains about the joints, which, connected with her previous illness. were supposed to be rheumatic, and treated with colchicum. On inquiry into her previous history, it was ascertained that she was very liable to hysterical symptoms and attacks; this, connected with manifest present symptoms of a similar character, led to the change of treatment from colchicum to valerian.

She states that, on a Monday, she first became affected with loss of sight in both eyes, and great intolerance of light, which continued until nearly the termination of the week. The attack first commenced with severe frontal headach, pain over both brows, which she likened to the pressure of some heavy penetrating body (clavus); the sight became imperfect and confused in both eyes, with great intolerance of light; spasmodic closure of the lids, and rotation of the eye-ball upwards and outwards, occurred whenever an examination was attempted; the tunics were all perfectly healthy in appearance, but the conjunctiva became of a bright scarlet colour from exposure to light, and the amaurotic derangement was attended by the sensation of globus, frequent efforts to swallow, and some sense of suffocation.

The attack was preceded and accompanied by great irritation of the *primæ viæ,*—the bowels were relaxed, and the stools foul and offensive. The affection was completely subdued in a few days by mild treatment, mainly directed to the secretions and evacuations, although slight intolerance of light continued troublesome for some few days after the entire removal of the other symptoms.

Remarks.—We may safely regard this case as a fair and nearly uncomplicated example of the acute hysterical amaurosis. In it we are led to observe the precedence of palpable hysterical phenomena, the sudden occurrence of amaurosis and intolerance of light in both eyes, and their speedy removal by mild measures; whilst *clavus hystericus* and globus existed throughout the whole course and duration, and no derangement in the uterine functions. In the treatment here, as in other examples I have seen, the symptoms have readily yielded to gentle mercurials, mild efficient purgatives, with or without glysters, and some antispasmodic. Local treatment is rarely required, and should such be needed, blisters behind the ears would hold out the best chance of good.

Chronic Hysterical Amaurosis.—I will commence this part of the subject by narrating a case of this form of amaurosis—a case, which, I believe, to have been simply functional, and dependent on hysteria as its originating and continuing cause; and which, as nearly uncomplicated, may furnish a good illustration of this variety.

Case.—A young woman, of sanguineo-melancholic temperament, about twenty-two years of age, who had previously suffered from hysteria, and who presented a peculiar nervous and bashful expression of countenance, frequently observable in the hysterical, become affected with symptoms which somewhat resembled those of chronic retinitis. She complained of imperfect sight in both eyes, great intolerance of light in both, a severe, circumscribed, occasional pain, as of defined pressure, over the brows, and occasionally, but rarely, of the appearance of luminous and dark spectra, especially on entering a brightly lighted apartment, or on looking at any white object, or something powerfully reflective of light.

On examination, the orbicular muscles were found to act spasmodically, the eyes watered profusely, and there was evidently the greatest intolerance of light; but there was little, if any, preternatural vascularity, or any abnormal or diseased appearance in any of the textures; the pupils were contracted. By exposure to light the eye became bright red, and the efforts to close the eyelids were as powerful as in strumous photophobia. When this case was taken, the same affection, with occasional periods of amelioration and relapse, had existed for many months, and yet all the textures retained their healthy appearance, transparency, and vascularity.

As to her general health, the patient stated that she was very nervous; that she was readily frightened and excited by slight causes, and had occasional troublesome symptoms about her throat, sensations of choking, and efforts to swallow, with the other characteristic feelings of *globus hystericus.* The pulse was quick and weak habitually, with the occurrence of occasional attacks of palpitation of the heart, chiefly in the evening, and on first going to bed; the functions of the uterus somewhat irregular, but otherwise healthy. She owned to nothing wrong about the functions of the organs of digestion, and the excretions from the bowels were regular.

She was treated by medicines directed to the condition of the catamenia, with tonics, and mild stomachic aperients, with antispasmodics, and stimulants—aloe and myrrh, and the compound galbanum pill; locally by leeches and blisters in the neighbourhood of the deranged organs, and astringent collyria to the conjunctivæ. There were frequent improvements and relapses during the treatment, which was thus extended over a space of many months; and, although in a less degree, the symptoms still continued unsubdued in the summer of 1840.*

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* This case occurred under the care of Mr Delegarde, at the West of England Eye Infirmary.

This is one of the first cases of the kind which especially drew my attention to the subject, and by the careful observance of which I became assured of its real nature, and which led me still further to observe similar instances, and to discriminate the more complicated illustrations of the same facts. The medical officers of the West of England Eye Infirmary had remarked something peculiar in this case, but, as far as I am aware, had never even made a guess of its pathology, until I explained my views to Mr Delagarde, in which that gentleman completely concurred at a subsequent period. This case clearly shows the peculiar symptoms, local and general, of chronic hysterical amaurosis as observed by the author, although my notes of the case are not very full. I may remark, that, in many other cases like the present, or more complicated, the patient has completely denied the existence of any derangement in the uterine functions, or any symptom whatever referrible to that organ.

To confirm my own views of hysterical amaurosis, I will avail myself of the following case, given by Dr Hull in his Cursory Notes, (p. 248), which that author has employed as a caution in not always expressing the truth to the patient.

Case.—Miss B., a delicate and intelligent young woman, has been for some years the subject of violent hysterics, during which she has even bitten her shoulders, arms, &c. deeply. These subsided, and in lieu she was affected with amblyopia. She was under the care of a judicious surgeon; and her dimness of sight was bearable and rather yielding; but she was told by an optician, of whom she was purchasing glasses, that her sight was going, and that in a year or two her cecity would be complete. Her distress of mind, from this annunciation, became at once profound and most injurious. She now has diplopia with her right eye; inability to read a line with either; and her general malaise of eyes, *photophobia*, and want of directing power are increased. When will the practitioner learn the paramount importance of respecting the mind of his patient?

I will now proceed to speak of the objective and subjective symptoms, terminations, pathology, and diagnosis of the disease, as far as my present opportunities of observation have extended.

Symptoms.—The symptoms which characterize this form of amaurosis are the following, dividing them into objective and subjective. Spasmodic contraction of the orbicular muscles of the eyelids, especially on exposure to bright light; evident intolerance of the influence of light on the retina,—a condition which occasions a sense of most distressing anxiety, profuse lachrymation, and firm, spasmodic closure of the lid, when we attempt to make an examination of the organ; and if we succeed in raising the lid, we find the globe rotated upwards and outwards still further to protect the suffering retina from light. The globe itself, when exposed, presents nothing unnatural; there is not the slightest zonular, pinkish, hair-like arrangement of vessels, which run straight to within a short distance of the cornea, surrounding that tunic; no conjunctival vascularity when the lid is first raised; but if continued in a strong light, then scarlet redness comes on, depending on the irritation and consequent hyperemia of the conjunctive vessels, but this quickly disappears on the removal of the exciting cause. The pupils (for the affection always exists in both eyes at the same time,) are contracted, and this in proportion to the degree of light present, and the severity of the morbid sensibility of the retina; but they contract and dilate fully and freely in either eye by alternation of light and shade,—proving that the state of the iris depends merely on its connection with the condition of the retina, and not on any specific affection of its own motile powers. The texture of the iris retains its healthy brilliancy and radiated appearance, its normal structure and colour; nor is there any irregularity in the pupillary edge, no retraction with bulging of the iris forwards, nor any alteration in the situation of the pupil. The vitreous humour retains its healthy character: hence the eyes are neither flaccid nor hard and prominent; there is no greenish discoloration, no deep-seated opacity. The lens, the cornea, the aqueous capsule, and the aqueous humour, are all healthy, and thus a local examination would lead to no knowledge of the pathological causes of the other symptoms which we learn from the patient, as the eye and its appendages appear perfectly normal in their structure and condition; but the retina and conjunctiva, and sympathetically the lachrymal gland and orbicular muscle, are morbidly irritable and sensitive.

The patient when questioned about her local symptoms complains of defective vision, and great sensibility to the influence of light. These being invariably connected, so that it is impossible to separate them, and specify how much the one is dependent on the other: thus when she (for I have never seen the affection in males,) attempts to view any object, it is at first imperfectly defined and clothed in mist; but the increased sensibility of the retina, the lachrymation, and the spasmodic closure of the lids, soon obstruct vision completely. In the dark the intolerance of light diminishes but never disappears, and the sight still continues imperfect, but is, nevertheless, improved; but, on the contrary, in bright sunshine, or in an intensely illuminated apartment, she sees little or nothing, and strenuously closes the lids, like a child suffering from strumous photophobia. The appearance of luminous or dark spectra is unusual, except occasionally from looking at white bodies, or those highly reflective of light, or on first entering a brightly lighted apartment; but they never trouble the patient as in retinitis, nor is the eyeball itself the seat of any uneasiness or pain. There are the general and local symptoms of hysteria present. Thus there is usually a circumscribed pain over the brow, analogous to clavus; a globular sensation originating in the abdomen and mounting to the throat, accompanied with a desire to swallow frequently, and with sensations of choking. There is great excitability and mobility of the general nervous system. Thus slight exciting causes produce exaggerated results; slight impressions hurry the heart and circulation, irritate the nervous system, disturb the passions and affections, derange the respiration, and may even bring on a complete attack of hysterical convulsions, coma, or catalepsy; whilst during the derangement of the nervous system, the patient frequently voids large quantities of a transparent colourless urine. The temper of such individuals is fickle and uncertain; the digestive functions not uncommonly somewhat deranged, and the process attended by borborygmi and flatulence. The uterus may or may not be healthy,—there may be either no derangement in the secretion of the catamenia; or they may be irregular in their occurrence, be morbidly profuse, or on the contrary scanty and secreted with pain.

Pathology.—I may inquire, what relation these local derangements, termed local hysteria, bear to that general affection of the nervous system, to which the specific title of hysteria is applied? Are we to regard them as strictly local derangements of innervation, produced, but modified, by the same causes which induce the hysteria itself, (if there be any,) or symptomatic of that general condition of the nervous system? Or lastly, a reflected action from derangement of the nervous centres? My own opinion is, that the amaurosis is a strictly local hysterical affection, analogous to those local nervous disturbances produced in the integuments, &c. covering the spine, and in many other situations, simulating disease of the part or joint, which are primarily dependent on the hysteria for their origin and existence, but may become localized and independent, just in the same manner as the local affections in acute rheumatism are primarily but local manifestations of a general disease, yet by continuance become independent of their constitutional origin, and may even go on to produce the disorganizing results of common inflammation, which the local affections never produce whilst they retain their dependent and specific character. Hence, in those cases where the symptoms denote the amaurosis as specific, the local irritation, (should there be any,) whether it be abdominal or uterine, bears no other relation to it than as an excitant of the hysterical derangement of the general nervous system, on which the local depends. If these propositions be regarded as satisfactory, before I proceed with the subject of Diagnosis, and to the elucidation of Mr Middlemore's queries, they will bear me out in stating, 1*st*, That the amaurosis should be attributed to the hysteria, and reckoned among those local anomalous derangements which this protean disorder is so fond of originating. 2*d*, In reply to the inquiry—what share do abdominal or uterine derangements take in the production of the local and general symptoms ?—we must reply that we cannot trace them both to the local irritation, or attribute them both to one and the same cause, since the hysteria is not necessarily connected with any local source of irritation, and certainly the amaurosis is not one of a simply sympathetic origin.

Diagnosis.—With such an understanding of the pathology of the affection, I will now proceed to answer the already proposed questions, and to give those other particulars which are necessary for a clear diagnosis. The diagnosis would be founded on the preceding and accompanying derangements, the history of the patient's constitution, and the peculiarity of the symptoms themselves. These peculiarities I will briefly sketch, premising that either of them would doubtless be modified by an hysterical constitution, so as to present anomalous symptoms ; and these being mixed up and forming an integral part of the symptoms proper to the sympathetic variety, would give either of them more or less title to the name of hysterical. I will first mention the diagnostic marks between hysterical amaurosis, and sympathetic uterine or abdominal amaurosis, and then those which would serve to separate the two latter.

1*st*, In the sympathetic amaurosis, the uterine or abdominal irritation would precede the developement of the amaurotic symptoms—the indications of such irritation being either acute and sudden, or chronic, and developed gradually ; whilst in hysterical amaurosis there is no necessary connection whatever with either uterine or abdominal derangement. Such may not exist at all ; it may precede or follow, exaggerating, however, the constitutional condition when any such affection exists or increases.

2*d*, The loss of sight in the sympathetic may be complete or partial, intermittent or permanent, not necessarily, or even usually, connected with or attended by intolerance of light, or the general or local manifestations of an hysterical diathesis. In the hysterical there is always (according to my own observations) the greatest intolerance of light, spasmodic closure of the lids, *globus hystericus*, and freedom from the ordinary signs of an amaurotic affection.

3*d*, In the sympathetic forms one eye only is affected in the majority of instances ; and in most cases, the textures bear more or less proof of vascular congestion, with determination of blood to the head, or a more passive hyperæmia, when the derangement is more chronic : hence, headach, heaviness, tendency to sleep, frequently deep, and accompanied by snoring ; derangement of the functions of the brain, denoted by inaptitude for any exertion of body or mind; the countenance is flushed, sometimes livid, and the carotids pulsate morbidly, or the jugulars are distended. In the hysterical, both eyes are always simultaneously deranged, and clavus is complained of as affecting the brow; whilst general cephalalgia and cerebral congestion are comparatively rare occurrences.

4th, Should the sympathetic varieties be chronic in their character, and attended by intolerance of light, our diagnosis may be assisted by observing that, under all circumstances, there is permanent defect of the retinal functions, and to a much greater extent than ever occurs in the pure forms of chronic hysterical amaurosis, whilst strabismus, or some common complicating symptom, is almost sure to be present.

5th, Again, sympathetic amaurosis is not unfrequently complicated with strabismus of a permanent form—an affection, which, I believe, never complicates the hysterical; but should such occur, as we may possibly imagine, it would be of a spasmodic character, and recur only at intervals from excitement or fatigue.

Derangement in distant organs, as the intestinal canal and uterus, produce sympathetic maladies either directly through the blood-vessels, by determination or congestion of blood, effected by a diminution in the nervous tone of the blood-vessels locally, and an alteration in their vital relations to the surrounding parts; by which the due relation of the force exerted by the blood, and the resistance offered by the coats of the blood-vessels is disturbed,—the latter yield, become distended, and contain an excess of the circulating blood; or, on the contrary, the way of production seems to be effected entirely through the nerves, and then the exact mode of action is much more obscure: sympathetic abdominal amaurosis is most frequently produced by the *modus operandi* first described, sympathetic uterine by the second.

In the comparative diagnosis of uterine and abdominal sympathetic amaurosis, there is rarely much difficulty. In both the primary cause precedes the development of amaurotic symptoms, although this may be more or less latent in its character, nevertheless, always detectable by minute and careful inquiry. The amaurosis which results from derangements in the *primæ viæ*, or some associated organ or set of organs, is frequently an acute affection; it occurs suddenly, succeeding some acute attack of dyspepsia, frequently from noxious or indigestible ingesta: the blindness may be complete, or nearly so; the pupils widely dilated and motionless; there may be ocular spectra, strabismus, and morbid nictitation. These symptoms may disappear as rapidly as they commenced, or pass off gradually, occasionally becoming chronic; but they are more frequently of short duration, or show themselves as a periodic affection. Uterine sympathetic amaurosis rarely, I believe, if ever shows itself as an acute attack of a similar kind; it is always preceded by evident uterine symptoms: the blindnesss comes on gradually, shows itself in one eye, is attended with a contracted pupil and intolerance of light; and the patient usually complains of muscæ, deranged and morbid appetite, a tendency to chilliness and faintness, frontal headach, but still more commonly severe pain in the occipital region.

In the chronic forms of the non-uterine sympathetic amaurosis the pupils are dilated (for here, on the average, one or both eyes are nearly equally affected simultaneously), their motions sluggish, the conjunctivæ congested, accompanying a similar condition of the head generally; there is a desire for light, in which the sight is best; in uterine, the eyelids are spasmodically closed, the eye waters, and the tunics become of a bright-scarlet colour, from exposure to a powerful light—thus entirely preventing any exercise of the retinal functions. The constitutional disturbance in both differs materially: in the abdominal, the skin becomes harsh and dry, the countenance sallow and shrunken, the conjunctivæ of a dusky yellow colour; the tongue is loaded with a foul dirty crust; the fauces secrete a scanty tenacious mucus, which adheres firmly, and frequently excites troublesome efforts to dislodge it; the breath is fœtid; the tongue and cheeks swollen and marked by the teeth; the appetite voracious; the mind desponding; and the bowels irregular; frequently there is pain in one or both sides, and a sympathetic pain in the shoulder. In the uterine, the circulation is irritable, the temper fickle, and the heart readily excited by exercise, or the mind's emotions. The last diagnostic signs that I shall mention are the differences in the primary originating causes, the disturbance of the functions of the *primæ viæ*, &c. or, on the contrary, of the functions of the uterus. Should these occur conjointly, they would, in all probability, both assist in causing the amaurotic symptoms, and then the amaurosis would partake of the characters of each. The occurrence of cerebral congestion is common to each, although, as I have previously mentioned, it is more common in the non-uterine forms.

The following case is a good example of amaurosis from uterine irritation. It was preceded by acute retinitis, occasioned by a flash of lightning, which was cured by bleeding and mercury, leaving the retina in a condition predisposed to the sympathetic amaurosis. I may observe that it approached most nearly to the symptoms of amaurosis from hysteria (chronic), as detailed by the author in the second volume of the Lancet for 1839–40; but was sufficiently distinct from that affection, as may be gathered from the diagnostic marks which I have already proposed.

Case.—A fair, florid young woman, of sanguine temperament, possessing many of the appearances characterizing the strumous constitution, twenty-one years of age, named Eliza Harwood, applied at the West of England Eye Infirmary, suffering from the following symptoms, brought on by a flash of lightning whilst employed with needle-work near the window which was open. Scarlet zonular vascularity not reaching the corneal edge, but leaving a white ring intervening; the vessels very small and straight, the zone well-formed but not intense. There was great pain in the head and eye, inflammatory fever, intolerance of light and lachrymation to an excessive degree, slight inflammation of the conjunctiva, and complete freedom from any inflammatory appearance of the cornea and iris. This attack occurred in the year 1838; it was subdued by blood-letting, purging, and mercury, followed by counter-irritation. This same patient presented herself again many months after the attack just narrated; she was now complaining of great defect of vision and excessive intolerance of light in the right eye, (the eye previously inflamed.) This condition, she stated, had already existed some time, being preceded and still accompanied by considerable uterine derangement; the irides of this patient were light-coloured.

She stated that she was of healthy and active habits, but had been engaged during some time in the unhealthy employments of a large factory. The previous history of the disease has been already mentioned.

On examining the affected eye some difficulty was experienced from the intolerance of light and the spasmodic closure of the lids, which were firmly contracted, and the eyeball rotated upwards and outwards. There was present slight conjunctival vascularity, much increased by a continuance of the exposure, all the other textures retaining their healthy brilliancy and normal appearance; there was no discoloration of the fundus of the eye-ball, no zonular vascularity;, the pupil was moderately contracted. She complained of occasional frontal headach, attended by the sensation of bright and dark muscæ.

The amaurosis was preceded and accompanied by uterine disturbance, on which it evidently depended; the catamenia were scanty, ill-conditioned and irregular, secreted with pain, and attended by an aggravation of the local symptoms. The nervous system was excitable, but free from obvious symptoms of hysteria; the gastro-enteric functions were well performed, with the exception of the habitual tendency to constipation.

That this affection was not inflammatory at this stage, may be deduced from the following list of symptoms; I think there can be no doubt of its uterine origin. *First*, then, the continuance of the disease for many months unattended by change of structure or brilliancy in any of the textures; *secondly*, the absence of the inflammatory halo; *thirdly*, the presence of intolerance of light, usually unattended by spectral illusions; *fourthly* and *lastly*, the marked presence of uterine irritation preceding and attending the progress of the amaurosis, producing an increase in its symptoms when augmented at the menstrual period.

The treatment resorted to was local and general; the uterine disturbance was treated by appropriate remedial measures, the general nervous system calmed by antispasmodics and tonics, whilst soothing local means were employed to the eye itself, and efficient counter-irritation maintained in the neighbourhood. She has since suffered from frequent relapses, none of which have occasioned the least change of structure.

Remarks.—In this case the derangement was confined to one eye, which, at an early stage at least of the sympathetic cases of amaurosis from uterine irritation, is always or nearly always, the case; whilst the amaurosis from hysteria as invariably affects both organs at the same time. My further remarks will best be given under a continuation of the subject of diagnosis.

As the symptoms of hysterical amaurosis resemble in some measure those of chronic retinitis, they possess sufficient analogy in their leading points to deserve a few remarks on diagnosis, both from the latter affection and also from photophobia and blepharospasmus, depending on strumous ophthalmia, or its accompanying constitutional derangement. The diagnosis from chronic retinitis is easy; it is unattended with that excessive contraction of the pupil which accompanies the active stages of that disease; the pupillary edge is not discoloured but regular and not retracted; there is no thickening, no effusion of lymph, no opaque or buffy discoloration of the fundus, but the humours are clear and transparent. In addition to these diagnostic symptoms the pupils dilate and contract by alternations of light and shade; it affects both eyes, whilst chronic retinitis is usually confined to one. If pain in the brow occurs in the hysterical it is of the nature of clavus, whilst in chronic retinitis it is of the characteristic inflammatory kind with its nocturnal aggravations. The constitutional symptoms vary also; in one there is well-marked hysterical derangement; in the other nocturnal febrile excitement. They agree in the symptoms of intolerance of light, lachrymation, imperfection of vision, which, however, in the case of retinitis, is accompanied by luminous spectra and a distorted broken image,—improvement of the symptoms in a weak light, and aggravation in an intense one; whilst in chronic retinitis there is deep-seated pain in the eye-ball, and zonular vascularity, which penetrates the sclerotica about a line from the cornea, leaving a white ring intervening, superadded; and this, though slight, is an evidence of its inflammatory character. The distinction between hysterical amaurosis and strumous photophobia, presents no difficulty. The latter occurs in children, is usually attended with minute phlyctenulæ on the cornea and conjunctiva; whilst the vascularity is of the fascicular character, and in imperfect light the sight is unaffected. I come now to

Prognosis.—Be it remembered that, in my observations on its pathology, I stated that it was my belief that the amaurosis, although at first but a strictly local manifestation of a constitutional condition, yet that, as in the case of rheumatism, it might become localized and independent of its constitutional origin. As I have seen cases of the chronic form exceedingly obstinate, and even when subdued, recurring again and again, I feel somewhat uncertain as to the usual termination of these cases, although, as far as I have been able to trace them, they have never presented any thing more than mere functional derangement. The probability is, therefore, that the amaurosis would receive a cure by the same means which put a stop to the hysterical condition of the system; but should a state of permanent hyperæmia, an alteration of nutrition, or any morbid formative process be set up by prolonged functional disturbance, (and this is neither improbable nor impossible, judging from analogy of the effects and consequences of functional disturbance in other organs, especially if that disturbance be severe in kind and prolonged in duration;) then a simple functional alteration of sensation and sensibility, which constitutes hysterical amaurosis, might verge insensibly into amaurosis from inflammation or congestion, or derive its origin from analogous or heterologous changes. As far as I am aware, acute attacks always rapidly yield to efficient treatment.

Treatment.—Although, whilst speaking of the different forms of the affection, and particular illustrations, I have likewise spoken of treatment, yet it becomes me now to say a few words connectedly on this subject; first, of the acute and then the chronic form. For the acute, our treatment should be directed to that derangement of function which calls the constitutional disorder into activity, and secondly, the correction of the condition of the general nervous system itself, whilst mere local treatment, directed to the condition of the organ of vision, is rarely required. In the chronic forms of this disorder, the treatment mainly turns on the correction of the hysterical constitution itself, involving, of course, the removal of any local disease or derangement which may excite or keep up the affection; and lastly, local measures, directed especially to the condition of the suffering organs, both as to sensibility and vision.

To effect these desirable indications, our treatment must be steadily and perseveringly pursued, and every advantage taken of physical and moral means, which the peculiar circumstances of each case may suggest. In the acute attacks, we must commence the treatment by clearing out the intestinal canal efficiently yet mildly, by purgatives and glysters, dislodging and carrying off scybalæ and foul collections. The purgative selected should be preceded or mixed with a full dose of calomel, or *hyd. cum cretâ*, and its operation modified by an opiate and aromatic, whilst nothing answers better as an enema than from half an ounce to one ounce of oil of turpentine, and a similar quantity of castor oil, properly combined with about one pint of thick gruel. Where there is tenderness of the abdomen, warm fomentations may be laid over its surface, which may or may not contain opium. The condition of the bowels, and the effects produced by the purgatives, will suggest either their removal, modification, or repetition. When the symptoms of hysteria remain after the full action of aperient medicines, we must treat the general derangement, and retain the bowels in a lax condition. At this stage, a mixture containing moderate doses of the *sprit. ammon. fœt.*, with *decoct. aloes, comp.*, and perhaps camphor, is the best mode of fulfilling our intentions. The patient's wishes should be attended to, when the head is affected, in respect to the exclusion of light, quietness, and cold applications; but these are unnecessary unless the symptoms be urgent.

Great perseverance and patience are requisite in the more chronic forms, and, as I have previously remarked, we are never sure of effecting a complete cure whilst the tendency to hysteria remains, since a fresh attack may occur at any time, and relapses are very common. I shall not enter on the details of treatment, but explain what I have myself remarked as the requisite circumstances to be attended to. They are, *first*, the treatment of the condition of the general nervous system, by appropriate antispasmodics; *second*, the general condition of the system,—whether it be below or above par;—in the first instance, by moderate blood-lettings, &c. in the last, by tonics, cold-bathing, brisk friction of the surface, and moderate exercise, &c.; *thirdly*, the removal of local complications, if there be any, ascertaining their nature and treating them philosophically—not on the empiric plan of ordering some invariable specific for this or that symptom, without reference to its causation. The local treatment of the amaurosis will, in some measure, be dependent on the general state, especially in reference to the employment of leeches; but a succession of blisters to the back of the neck is nearly applicable to every case, with occasional modifications. Soothing applications to the eye may be used, but they are of little real benefit, and even belladonna, when smeared over the brow, in the state of moistened extract, occasions little if any relief. Such I believe to be a faithful outline, which any practised mind having to reduce to actual employment, will readily fill up, and adapt to those particular examples which he may have as the objects of his care.

Before concluding this paper, I would observe that few authors have noticed cases of this kind, and none, as far as I am aware, had traced the affection to its proper source before my papers appeared on the subject. Mr Tyrrell, in the second volume of his work, which appeared in the summer of 1840, has classed several functional complaints under the head of "neuralgic affection." He remarks, "Some of the most distressing cases of this kind which I have seen have been in young and delicate females, subject to deficient or irregular uterine action; or in those evincing a marked hysterical diathesis." "There is," he remarks, "generally intolerance of light, and in some cases the pupils have been smaller than natural. The cure is usually protracted in this disease, and is, in many cases, excessively tedious, occupying a period of years. The patient is very subject to relapses."*

Again, in the excellent lectures of Dr Watson, published in the London Medical Gazette, 1840—41, at p. 712, we find the following remarks and case, which case, however, though functional, was not a true case of hysterical amaurosis. The doctor observes, "Amaurosis is said also to occur as an hysterical affection; and I am certain that I have seen this myself."

CASE. "An unmarried lady, of a very nervous and susceptible habit, came to town in great apprehension about her eyes, the sight of one of them being quite gone. I could perceive no defect in the eye itself. I saw her in consultation with Mr Travers, who took an unfavourable view of the case, and thought the chance of recovery was very slender. I had one reason for hoping a better result, in the knowledge of some facts which Mr Travers was not aware of till I mentioned them to him. I had been acquainted with this lady for some years, and during that period she had several times almost entirely lost, and again recovered, the use of her lower extremities. On two occasions she had been affected with aphonia, and unable to speak, except in a whisper, for months together; and then, on a sudden, without any apparent cause, her voice returned. I trusted, therefore, that this suspension of the powers of vision in one eye might be a similar freak; and so it turned out. After a few weeks the sight returned, she knew not how, and she has since lost it a second time, and a second time regained it."

In Dr Abercrombie's chapter on the "Pathology of the Spinal Cord,"† we find some interesting cases detailed, which, in the author's opinion, were undoubtedly hysterical. In one, the symptoms were very peculiar, and among others she suffered from paroxysms of a cataleptic nature. During "these attacks she became suddenly silent and motionless; the eyes open, but fixed and insensible, with total unconsciousness of every thing." Loc. cit. p. 410.

In conclusion, the author trusts that the forgoing observations may not be unacceptable, although the subject ranks not among the first in pathology, since a clear knowledge on this and on many other points, at first sight, comparatively unimportant, are in truth of essential advantage to the practical physician, not only in detecting the nature of an important malady, but in separating it from other forms somewhat similar in symptoms, but unallied in pathology, and hence of directing an appropriate treatment to those several forms which his diagnosis has disunited. Besides, a knowledge of its pathology adds one link to the chain of nature's operations, which, however disconnected and separate it may appear, is still indivisible and continuous; and hence aids that research which would trace its gradual transitions, and follow it from link to link in its most certain connections.

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* Vide pp. 4, 95, 96, 97.

† Practical Researches on Diseases of the Brain and Spinal Cord, 3d edit. enlarged.

ART. IV.—*Case of fatal Encephalitis with Hemiplegia, immediately excited by Cantharides, in consequence of intense predisposition from Basilar and internal Carotid Aneurisms.* By P. N. KINGSTON, M. D., Physician to the St George's and St James's Dispensary.

JAMES HULLAH, between 14 and 15 years of age, shoemaker, was admitted my patient at the Dispensary, October 17, 1836.

On my first visit to the patient, at 2 P. M. I received from the brother and his wife the following account. The patient had come up from the north of England a year and a-half ago, since which time he had lived with them, and had been employed in shoemaking. At the period of his arrival, a tumour was noticed on the right side of the neck; it was said to have existed for two years previously, and has since been gradually increasing in size. If reproved for staying out too long on errands, he would appear much flurried, and the tumour was wont to throb violently; and in March there were some pain in the region of the tumour, and some difficulty of swallowing, which were attributed to the effects of a common cold. He is not known to have had any other ailment during the period of his residence in London. Headach he has never complained of; and he has been considered strong, healthy, industrious, well-disposed, and not deficient in intellect.

He had come home last night at a little after nine, had a supper of meat and bread, with a very little beer, and then gone to bed appearing well. The following morning he, as usual, got up early, and carried home some articles of moderate weight; at eight, he made an unusually hearty breakfast of bread and butter and weak coffee, of which the brother, with his wife and children, partook without ill effect; and he then worked at shoemaking for three-quarters of an hour. At nine, on his getting up to leave the room, he was observed by his brother to tremble violently all down the right side of the body. The patient went out, and had descended the first flight of stairs, when his brother overtook him. He was able to walk up stairs again, but continued to shake all the way. The affected limbs were briskly rubbed, and he was laid on a bed. Within five minutes vomiting began, and has several times recurred.

At present, the pulse is 80, natural; the heart's sounds and impulse natural; the tongue whitish, speckled with small red papillæ. The bowels had not been opened for four days.

Is lying on the back in bed, and on making an effort to rise, is unable to do so in any degree. He can flex the right thigh a little, but has otherwise hardly any power over the right upper and lower extremities. These extremities, as well as the right side of the neck, chest, and abdomen, are not affected with spasm, tonic or clonic. They feel numb, and have a deficient and peculiar sensation, on being pressed or pinched. In speaking, the articulation is extremely indistinct, and the right side of the mouth is motionless. The tongue is protruded with difficulty, and only for a short distance. His countenance expresses much distress at the inability to move or speak distinctly. His mind is not appreciably impaired.

On the right side of the neck, just below the jaw, there is a tumour, of the size of two-thirds of an orange, protruding the sterno-cleido-mastoid muscle, and projecting on each side of it. It communicates to the eye and hand a moderate pulsation, and to the stethoscope a strong impulse, accompanied by a blowing sound, synchronous with the radial pulse.

The doubtful character of the case led me to defer for a few hours the more active antiphlogistic measures; and, in the absence of all information that cantharides had been taken, one of the remedies prescribed was a brisk dose of oil of turpentine and castor oil, to be taken immediately, and repeated the following morning.

October 18th. This morning the patient acquainted Mr Anthony, the apothecary of the Dispensary, and myself, that, on the night of the 16th, he had taken some Spanish fly; and it appeared from the evidence given after death at the coroner's inquest, that, between eight and nine that night, he had obtained from a boy an apple, into which some Spanish fly had been introduced, for the purpose of administering it clandestinely to another person.

He had a copious motion about eleven last night, and another about five this morning. After the first motion the vomiting, which had previously been frequent, was suspended till ten. It then recurred several times, attended with coldness of the extremities and great weakness of the pulse. Yesterday no urine was passed; in the course of to-day about a spoonful on several occasions. Both yesterday and to-day it was repeatedly noticed by Mr Anthony and myself that there was no priapism.

3 P. M. The tongue is covered with a thick yellowish film; the face is usually pale; both sides of the body are equally warm and moist; the pulse is 78, regular, of moderate size and strength; the respirations are 28, usually tranquil; but from time to time there is a suspension of respiration for about half-a minute, followed by spasm of the larynx and great effort, and a purplish suffusion of the face, lasting a minute or two or longer, and terminating in the discharge of fluid from the stomach.

He has all the morning been lying quiet, with the eyelids half-closed, the eyeballs turned a little upwards, the pupils slightly and equally dilated; but understands when spoken to, and tries to answer. He is able to articulate, open the mouth, and protrude the tongue still less than yesterday. If he attempt to swallow either food or drink, it is immediately returned from the pharynx. He was again observed while being put into bed to retain, no power whatever over the right side of the body.

He continued in nearly the same state for some hours, except that he swallowed without difficulty several doses of camphor emulsion, by which he was always for a time revived.

At 7 P. M. consciousness could still be faintly roused, the power of articulation was entirely lost, the breathing had become very loudly stertorous, the pulse was slower but more full and firm, the surface warm and perspiring profusely.

At 11 P. M. he had become totally insensible, with pupils greatly dilated. The breathing had ceased to be stertorous; the pulse had fallen below 60, being still very full and firm.

At 11½ P. M. he died.

Sectio Cadaveris 15 hours after death. The body was moderately developed. Its surface towards the dependent part assumed a mottled purple colour; and the face was livid and slightly œdematous. The tongue was encrusted with whitish sordes. The pharynx and œsophagus were of natural appearance.

The stomach was of moderate capacity, and contained half-a-pint of fluid. Its mucous membrane was drawn up into folds, some of them several inches in length, most numerous towards the œsophagus. The greater number of those both at the superior and at the inferior portions of the stomach were of a rich red colour, the hue of which was in some places light, but in general very deep, and deepest in those near the œsophagus. The redness was in all instances seen to depend on minute vessels beautifully interwoven. All these reddened portions were greatly softened, and easily peeled off from the subjacent tissue. Besides these plicæ, there were at the greater curvature, rather nearer the œsophagus than the pylorus, a good many broad patches, from four to eight lines in diameter, of the same redness and softness, and felt to be distinctly elevated as the finger was passed on to them from the surrounding surface. The mucous membrane intervening was for the most part pale, and was of natural firmness, except in the neighbourhood of the pylorus, where it was somewhat softened, but less so than the reddened portions. The red and pale portions contrasted with each other in physical characters to a degree that I never witnessed otherwise than from the action of an irritant poison. Towards the pylorus the mucous follicles were enlarged and elevated, with a dark speck in their orifices.

The mucous membrane of several parts of the intestines was somewhat reddened and softened, but in a very inferior degree to that of the stomach. And in the ileum there was a development of some of the glands of Peyer and Brunner, with or without a little surrounding redness and softening.

About ten of the mesenteric glands belonging to the ileum were converted into fibro-cartilaginous capsules of the size of marbles, filled with hard dry calcareous matter, which in one was mixed with a matter like putty.

The spleen was softened to the consistence of jam.

The kidneys were of a deep purplish red colour, both externally and internally, and poured out on section a large quantity of blood; the cortical portions were decidedly softened, while the medullary portions retained the natural consistence. The infundibula, pelvis, and ureter of the right contained nearly two drachms of a nearly opaque white fluid, of creamy consistence, and a somewhat flaky, striated aspect. The left kidney contained none. The interior lining membrane of both kidneys and ureters presented to the eye nothing unnatural.

The bladder was rather contracted. It contained about three ounces of thin fluid, which was of blood-red colour, but perhaps from accidental admixture. Over nearly half its extent, at the cervical extremity, its mucous membrane was of a dark crimson colour, which was here and there diffused, but for the most part seen to depend on a congeries of vessels. The redness towards its limits gradually diminished in depth from a diminution in the number of injected vessels. Its surface was decidedly softened, and easily detached with the nail. In the deeply reddened part there was one small, well-defined, irregularly-shaped, white depression, having the appearance of an incipient ulceration. The rest of the mucous membrane of the bladder preserved a natural paleness and consistence.

The lungs were somewhat congested generally, and very much so at the posterior part of the right side; the trachea and bronchi were congested, and filled with frothy reddish mucus.

The blood in the heart's cavities was all fluid. Its muscular tissue was very flaccid. The left cavities were rather dilated. There was nothing morbid in the state of the valves.

The right internal carotid artery formed a large aneurismal dilatation. It commenced with a sudden thickening of its tunics about a line from its origin, expanded gradually to a circumference of three inches, and after maintaining that calibre for a distance of two inches gradually contracted, though even after passing through the carotid foramen it was still rather wider than natural. The dilated portion was thickened in various degrees. Dispersed over it were smooth elevated patches, whose thickness was in some instances a line and a-half. In these, the serous and subserous tunics were greatly thickened; and were either of a white semi-opaque appearance, and of nearly cartilaginous hardness, or they were reddish and much less firm. In the intervals between these patches, the serous and subserous tunics were wrinkled up longitudinally; and underneath there was frequently a white opaque matter, which was pulpy in some places, in others tough and firmly adherent.

The basilar artery was also dilated into an aneurism, of the size of a moderate walnut, of oval shape. The vertebral arteries entered straight into the inferior extremity of the sac, at a distance of about a line from each other. From the other extremity, the basilar artery was continued for a short distance before its termination in the posterior cerebral arteries. The aneurism was distended with coagulum, which adhered slightly to the artery, was moderately firm, and of a dark-red colour approaching to black, except at the cerebral surface of the aneurism, where it was of a light-red colour, and traversed with light-yellow arborescent lines. At the more dependent part of the aneurism, the two inner tunics were much reddened, and there was a lamina of soft dark coagulum between the middle and outer tunic. The inner tunic was drawn up into small longitudinal plicæ; and about a third part of the surface underneath was occupied with small firmly adherent patches of yellowish white opaque appearance. The middle tunic was considerably thickened.

The rest of the basilar artery, the vertebrals, and the branches of the internal carotids within the cranium were all healthy.

The vessels on the surface of the brain were congested. The substance of the brain generally was rather softer than is usual so few hours after death; but exhibited no undue vascularity. The right lateral ventricle was greatly dilated, and contained nearly an ounce of limpid serum; and its surface was traversed by several enlarged dark red vessels. The left lateral ventricle exhibited no dilatation or serous effusion; and its vessels were natural.

By the pressure of the basilar aneurism, the *Pons Varolii*, instead of preserving its usual rounded form, had become completely flattened both at its right and left sides; and was considerably softened, though without discoloration, for the depth of about three lines, beyond which its texture soon, but gradually, regained the natural consistence.

Remarks.—The principal cause on which the cessation of the vital functions immediately depended, was the obstruction to the action of the brain, arising from the inflammation of the *Pons Varolii*, and from the inflammation of, and consequent effusion into, the lining membrane of the right lateral ventricle.

To the production of these inflammations, the aneurisms of the basilar and of the right internal carotid arteries must have largely contributed, by the liability they occasioned to disturbance of the cerebral circulation from slight causes, and by the pressure of the basilar aneurism on the *Pons Varolii*. But the carotid aneurism is known to have existed for three years and a-half, and to have increased very gradually; and the basilar aneurism must, from its texture, and from the absence of all decided symptoms, up to the last few hours of life, be inferred to have lasted for some months at the least, and to have been gradual in its progress; and there was nothing in the appearance of these aneurisms which indicated any sudden increase of their size or alteration of their texture immediately before death. So that there is no ground for supposing, that, in relation to the encephalitis which was so speedily fatal, they did more than occasion an intense predisposition.

The causes by which the encephalitis was immediately excited must be sought among circumstances, which, like itself, came into existence during the last few hours of life. Such a group of causes is furnished by the irritation and ultimate inflammation of the stomach, kidneys, and bladder, and by the direct action on the brain and other parts arising from any portion of the cantharis which may have been absorbed.

A recent gastritis to some extent was satisfactorily characterized by the vascular redness, the softening and the thickening of certain circumscribed portions of the stomach; and by the long-continued vomiting, which, though it might have been produced by the cerebral affection, still goes to complete the evidence of gastritis. The almost total suppression of urine, the softening and extreme congestion of the kidneys, and the puriform fluid which filled the pelvis of the right, and the redness and softening of a portion of the mucous membrane of the bladder, leave little to desire in proof of recent inflammation of these organs.

That some Spanish fly was swallowed is certain from the confession of the deceased; the quantity is doubtful. It is evident, however, that a dose, intended to have been administered in an apple, without the knowledge of the person who took it, must have been very far indeed below that which is ordinarily fatal.

The inflammations having occurred within a few hours after the swallowing of the cantharis, and being those which this substance usually produces, must unavoidably be referred to it as the exciting cause. The quantity taken was indeed very much less than would in most people be required to produce the effect; but it is allowed to be one of those poisons whose action is liable to be wonderfully exalted by predisposition and idiosyncrasy. Orfila in his Toxicologie, and Christison cite cases of its operation, several of which are perhaps equally extraordinary. And let it be considered, that, in the cases where a small blister to the skin has occasioned inflammation of the kidneys and bladder, the quantity which, by its absorption, has produced this effect, must have been exceedingly minute.

The nervous impressions transmitted to the brain from these irritated and ultimately inflamed organs, and the direct irritation of the brain and other parts occasioned by that portion of the cantharis which may have been absorbed, and by the deterioration of the blood arising from the suppression of urine, will be allowed competent to have acted as the exciting causes of the cerebral inflammations which immediately supervened, and to which the aneurisms so intensely predisposed; and they furnish the most probable mode of accounting for the fatal seizure at the precise period of its occurrence. How slight a cause of irritation is, under certain states of predisposition, adequate to this effect, may be gathered from the following remarks of Dr Christison. "In a few diseased states of the system there is an increased susceptibility of the action of poisons; and it is important that the medical jurist should attend to this circumstance. When a poison has a tendency to bring on a peculiar pathological state of the system, or of a particular organ, which is also produced by a disease existing at the time or impending, violent and even fatal consequences may ensue from doses of poisons, which, in ordinary circumstances, are innocuous or beneficial."

In the present case there is no reason to suppose, that, if the cantharides had not been taken, life would not have lasted some time longer, under circumstances which had never before exercised any appreciable influence on the health; and by the ligature of the carotid affected, even the basilar aneurism might have been so reduced as to permit the prolongation of life for an indefinite period. This probability of continuance of life, and this chance of partial cure, were cut off by the effects of the cantharides.

The case is important in a pathological point of view, as showing that a basilar aneurism may, if developed gradually, attain the size of a walnut, and may exert a pressure sufficient to flatten the naturally rounded form of the *Pons Varolii*, without appreciably interfering with the functions of that important part, or disturbing the general health, even though combined with a large aneurism of one of the internal carotids; and as showing what slight irritation is, under these circumstances, adequate suddenly to light up that inflammation to which the pressure so intensely predisposed.

In a medico-legal point of view, it represents a class of cases deserving, perhaps, more consideration than it has yet received; cases where, from the influence of pre-existing disease, life is cut short by doses of poison too small to prove fatal to persons of sound constitution. In such cases, what opinion should be given by the medical witness in a court of law as to the cause of death? I know it to be the opinion of some, that, under such circumstances, death should be referred entirely to the pre-existing disease, without any allusion to the poison. Such an opinion may, perhaps, be deemed so palpably incorrect, as hardly to merit a refutation. But, as it is desirable to promote unanimity on a point affecting the security of society, it may be worth while briefly to contemplate the consequences of such a mistaken course.

There is always a considerable portion of the community labouring under diseases, which are themselves dangerous to life, and which render the constitution both more susceptible of noxious influences, and less capable of bearing up under their effects. Many such lives might be cut short by doses of poison, which would in healthy persons occasion only slight disorder, or perhaps be altogether unfelt. Some of these persons entirely get the better of the disease which so predisposes them; others live on in spite of it for many years; and even those who must inevitably die of their disease, within a few days, have often reason to attach very great importance to that short span of continued existence. If any one, knowing how easily their thread of life may be snapped, should, with intent to kill, administer poison in a dose which proves fatal to them, although far short of what would be fatal to healthy subjects, that person is not the less guilty of the crime of murder, on account of the cunning and dexterity with which he accomplishes his purpose.

At the coroner's inquest held upon the body of James Hullah, I gave my opinion to the following effect:

That death was immediately caused by an inflammation of the brain and effusion into one of its ventricles, aided in some degree by inflammation of the stomach, kidneys, and bladder;

That these fatal affections occurred within two days of death, and a few hours after the deceased had swallowed a certain quantity of Spanish fly, which is classed among irritant poisons;

That life would not have terminated at this precise period, if the cantharides had not been taken; but that the quantity which would seem to have been taken was very far too small to have been of itself fatal, and would not, in the present instance, have been followed by fatal results, if there had not been intense predisposition to inflammation of the brain, arising from aneurisms, one of which was pressing on a very important part of that organ.

In a trial for murder, alleged to have been perpetrated by a very small dose of poison, rendered fatal by pre-existing disease, the jury would of course require evidence of murderous intention much more direct and decided, than in cases where the quantity of poison administered is such as would be ordinarily fatal: but should they, by the evidence adduced, be satisfied of the murderous intention with which the substance was administered, they would, after such a medical opinion, as to the cause of death, feel justified in returning a verdict of guilty.

ART. V.—*Case of Extra-Uterine Conception.* [Read before the Edinburgh Obstetrical Society on the 12th October 1841.] By P. FAIRBAIRN, M. D., Fellow of the Royal College of Physicians, Edinburgh.

MRS R., aged 37, of fair complexion, was believed to have conceived for the third time about the middle of June 1841. She had been seven and a-half years married, and five years had elapsed since the birth of her last infant. From the time at which the symptoms indicating conception had taken place, the ailments incident to that situation were much less troublesome than during the two former pregnancies. She was, indeed, in the habit of taking a great deal of exercise, without fatigue or the smallest inconvenience. On one occasion, however, she expressed to a near relative the belief that there was certainly something unusual in her situation, although, on being asked her reasons, she could not specify any thing particular in her sensations to justify this inference.

From the 24th of May until the 24th of August, she resided at Portobello, and was in the habit of bathing regularly in the sea every other day. This practice was continued until about the 17th of August, when on that day, the tide being very far back, she was alarmed by the bathing machine being rapidly driven into the water; and she experienced considerable uneasiness from the jolting motion. She bathed, notwithstanding, herself as well as her two little boys as usual. On returning home, she felt herself very unwell from pain in the back and right iliac region; there was slight uterine irritation with sanguineous discharge, and a feeling as she would part with the fœtus. Rest in the horizontal posture, cold applications to the external parts, and light cooling diet were suggested by a female friend. Next day she felt so well as to be able to leave her apartment. Two or three days after this, having eaten a few cherries and indulged rather freely in buttermilk, she suffered from an attack of diarrhœa with slight abdominal pain. There was likewise irritation of the bladder and rectum, and a discharge of blood from the latter, which was supposed to proceed from internal hæmorrhoids, to which she was liable. Rest for a very short time, a dose of castor-oil with laudanum, followed by a diuretic, afforded complete relief. During her stay at the sea-side no professional person was consulted.

On the 1st of September, I was requested to visit her in town for the first time. She was in bed, and complained of occasional spasmodic pains over the abdomen, with a degree of fulness and tenderness in the uterine region. There was sickness, bilious vomiting, and foul tongue, with slight febrile excitement. These symptoms were attributed to her having eaten a few plums, and taken a draught of porter the previous evening. She likewise suffered from irritation in the bladder and rectum, with a considerable discharge of coagulated blood from the bowels. I was informed that she was about the third month of pregnancy. My object in the treatment was to allay the irritability of the stomach by saline draughts with opiates and anodyne frictions; afterwards to administer laxatives and diuretics with opiate enemata. These means in a few days completely answered the purpose, and on the 6th she felt herself so well as to engage in her usual avocations.

I was summoned again on Monday the 13th, in consequence of slight sanguineous discharge *per vaginam*, painful micturition, tormina and tenesmus, with a feeling of bearing-down efforts. On examination *per vaginam*, the *os uteri* was felt perfectly natural, but nothing like distinct labour-pains; the uterus was evidently enlarged, and there was a slight discharge of muco-sanguineous fluid. As the bowels had been opened by a laxative, an opiate enema was administered, followed by a full dose of the spirit of nitrous ether; and cold applications to the external parts. The urgent symptoms having been allayed, and the discharge checked, I discontinued my visits until Friday the 17th September. On that day, on being shown into the dining-room, where my patient was, she expressed her surprise at my visit, appeared cheerful, said she was quite well excepting a little debility, and informed me that she could now dispense with my services. Before taking leave, however, she told me that, when in bed, she occasionally felt in the right iliac region, exactly in the site of the *caput cæcum coli*, some pain which disappeared on change of position. On applying pressure, she experienced no pain. Supposing that it might be connected with derangement of the bowels, I requested her to take a dose of laxative medicine, and to repeat it as occasion might require, and to informe me if she had any return or felt any unusual sensation when in bed.

On Sunday the 19th, about half-past 2 P. M., a hurried message was brought me, stating that Mrs R. was taken dangerously ill, and requesting my immediate attendance. On entering the house, I was met by her husband, who informed me, that he believed his lady was dying; that about half-past 2 o'clock P. M. she had fainted in the arms of the servant, from a sudden attack of pain across the lower part of the abdomen, whilst in the act of going from her bed-room into the dining-room; and regretted, that he and the other members of the family were all at church when the accident happened. I was informed likewise, that she was perfectly well. and in good spirits between the forenoon and afternoon services: but her brother had remarked, that her countenance looked somewhat pale, and her hand felt cold in the forenoon. On going to her bedside, I was shocked at her ghastly appearance; her face was deadly pale, with a constant feeling of sinking; the pupils were contracted and inanimate; the body and extremities covered with a cold clammy perspiration; the heart beating rapidly and tumultuously; and no pulse was perceptible at the wrist, nor in the humoral artery. The patient suffered from distressing sickness, with occasional attempts to vomit. The abdomen was tumid, and somewhat tender on pressure, and across the epigastrium the swelling was slightly tympanitic. On examination *per vaginam*, the *os uteri* was felt perfectly natural, but there was no sanguineous discharge. She was perfectly sensible, and answered questions distinctly.

I ordered immediately a wine-glass of brandy with warm water and sugar to be given in repeated doses, and to be renewed as occasion might require. Afterwards a tea-spoonful of the aromatic spirit of ammonia in water was administered. Bottles of warm water and warm flannels were applied to the body and extremities, and replaced from time to time. The pulse after some time was felt. It could be counted ranging from 120 and upwards; it soon, however, again became imperceptible. Although there was some appearance of reaction, yet the heat of the body could not be restored. Six P. M. had a consultation with Drs Davidson and Newbigging. Her situation was considered most alarming. We were of opinion that her disease must be either a case of abdominal aneurism, rupture of the stomach, or extra-uterine conception; and, in justice to Dr Davidson, I must candidly declare, that he certainly had the merit of suggesting the last, which turned out to be correct. The practice to be pursued was abundantly evident, viz. to support the powers of life. With this view, the stimulants, as ordered, were to be continued to the extent of a table-spoonful of brandy every half hour, occasionally intervening a dose of the ammonia; and the warm applications to be diligently renewed. After Dr Davidson left us, she became more restless, tossing her arms from under the bed-clothes, and now and then attempting to turn or raise herself in bed. She complained of pain sometimes between the shoulders, or at the *scrobiculus cordis*, and occasionally over the abdomen, with sickness and frequent belchings. She stated that she felt a rushing sensation in the abdomen, as if from the escape of a fluid, and expressed her belief that she was dying. A cloth applied to the external parts was slightly stained with blood. Mustard synapisms and a bag of hot salt were had recourse to with the view of relieving the pains, but without effect.

Seven P. M. Had a second consultation. The symptoms were then greatly aggravated, and to all appearance she was rapidly sinking. Her breathing was much oppressed; she lay upon the back, occasionally moaning in a complete state of collapse, deadly pale, cold, covered with clammy perspiration, and perfectly pulseless. She was sensible, however, and answered questions distinctly. An enema of brandy and warm water with twenty drops of laudanum was administered, whilst the stimulants by the mouth were repeated as often as possible.

Some short time before her death she was calm, the breathing slow and heavy. At length, however, she became unconscious of surrounding objects, and about 8 o'clock P. M. expired, exactly five hours and a half from the fatal attack.

Sectio cadaveris, 19 hours after death, in presence of Drs Davidson and Newbigging, Sir William Newbigging, and Alexander Ziegler, Esq. surgeon. The external surface of the body was pale. The features were sharp and shrunk, whilst the integuments covering the face were pitted, giving the appearance of the remains of small-pox, although in life perfectly smooth. On cutting into the abdomen and reflecting its parietes, a large quantity of dark fluid and coagulated blood (not less than six pounds), occupied the lower regions of the belly, and entered between the folds of the intestines, covering at the same time the bladder, uterus, and its appendages. The blood was carefully removed with a sponge and the fingers, when a tumour of an oblong, roundish, uneven and nodulated form, somewhat larger than the fist, presented. It lay exactly over the bladder, and inclined a little to the left iliac fossa. The sac by which it was enveloped was of different degrees of thickness; in some parts, it was firm, solid, and of a fleshy consistence; whilst in others, it was thin, delicate, and pellucid, thereby enabling us to get a view of the outline of the extremities of a fœtus. Near to and running parallel with the Fallopian tube, and between the folds of the *ligamentum latum*, there was an angular pouch filled with bloody serum and mixed with coagula. On raising the tumour cautiously, it was found to be connected with the left Fallopian tube, whilst the uterus was seen in its natural situation between the bladder and rectum. No doubt now remained that it was a case of extra-uterine conception, and in order to examine the parts minutely, the friends kindly permitted us to remove them from the body.

The parts being removed, an incision was made along the posterior surface of the tumour, and a male fœtus about the third month brought into view. The head occupied the lower part of the tumour, and the back presented towards the left side. The placenta was attached to the superior and anterior part of the sac, and received maternal blood by means of vessels which passed into it along the upper part of the broad ligament near the external extremity of the Fallopian tube. The placenta, amnion, and chorion, were all perfectly natural. Between the placenta and membranes of the ovum and sac, there was distinctly traced a strong, firm, tunic, about one line in thickness, and of a reddish-brown colour, surrounding the fœtus; exterior to this was another membrane of a fine delicate texture and bluish colour, resembling the arachnoid. The latter was probably of adventitious formation.

The sac containing the ovum appeared to be formed, partly by the fimbriæ of the Fallopian tube stretching over the tumour, partly by layers of the *ligamentum latum* running anteriorly and posteriorly, and partly by adventitious membrane, the result of inflammation in the process of the fœtal development. All these different structures could be satisfactorily traced.

In regard, however, to the ovum being situated within the layers of the *ligamentum latum*, there could be no doubt. It is difficult, perhaps, to conceive how that happened, except by supposing either that it had pushed the membrane before it ; or, that a portion of the ligament had been removed by absorption, and the ovum, as it became gradually developed, insinuated itself between the folds of the membrane.

The placenta was partially detached from the membrane, as formerly described, surrounding the ovum by a mass of semifluid blood, evidently the result of the fatal rupture. In addition to this, the chorion was separated from the peculiar membrane more or less extensively, by masses of decolorized blood, producing the peculiar nodulated appearance of the tumour. These nodulated masses of blood were evidently the product of repeated effusions, and, upon the whole, had more or less the appearance of what is observed in aneurismal tumours. The fatal hemorrhage was produced by two extensive ruptures, the largest of which was placed on the anterior surface of the tumour, and contained a portion of the placenta protruding through it; and the other upon that part of the tumour opposed to the uterus.

The left Fallopian tube measured four inches in length ; it was quite pervious throughout, but the abdominal extremity of it for about one inch and a-half was considerably dilated. The upper part of the fimbriated margin was sufficiently distinct for some way over the tumour; the lower part was not visible, having apparently become incorporated with the walls of the sac. The left ovary was natural, and perfectly free from the tumour, and contained a well-defined *corpus luteum.* The right ovary was enlarged and indurated, and on being opened presented a spongy, mammary-looking structure, of rather a malignant character; but the Graafian vesicles and blood-vessels appeared natural. The Fallopian tube was twisted and adherent to it, and the neighbouring parts.

It is probable that these changes of structure were the result of previous inflammatory action.

The measurement of the uterus was as follows, viz. five inches in length, from the centre of the fundus to the edge of the anterior lip; three inches and a quarter in breadth between the attachments of the round ligaments, rather more than half-an inch in thickness of the walls. In fine, the uterus presented all the appearances of a uterus from the eighth to the tenth week of pregnancy. On laying it open anteriorly by a longitudinal incision, it was found to contain a thick spongy decidua, which was chiefly attached to the fundus, and occupied the whole of the uterine cavity, and was seen to project slightly within the uterine extremity of the left Fallopian tube The *os uteri* presented a natural appearance, and was filled up by the usual gelatinous plug.

The parts were carefully dissected and examined by Dr Reid of the Royal Infirmary, and Mr Goodsir, Conservator of the Museum of the Royal College of Surgeons, to whom I am much indebted. The drawing was executed by Dr Robert Paterson of Leith, and is a correct and faithful representation of the appearances exhibited in the course of dissection.

Plate II. presents a view of the objects described in this paper: U, the womb laid open by a longitudinal incision, showing its inner surface lined with the decidua; F, the fœtus lodged as described above.

Art. VI.—*Practical Remarks on certain effects of the Ergot of Rye when administered in Obstetric Practice.* By William Catlett, M. D.

In analysing the recorded statements of different writers upon the effects of ergot on the human gravid uterus, the striking discrepancy which pervades them is not the least remarkable feature which these data present; and any attempt to reconcile such discrepancy might appear useless, were there not reason to believe that this difference of opinion can only have originated in the want of a long-continued series of well directed observations.

As it can scarcely be conceived that any one in the present day will be prepared to maintain the total inertness of the drug on the one hand, or implicitly to credit the exaggerated effects that have been imputed to it on the other, a just appreciation of its powers appears to be a desideratum, and any practical remarks that bear upon the subject may not be devoid of interest.

It will be less, however, the object of this paper to investigate these several contradictory views than to illustrate certain pathological effects of the drug when administered to the parturient female, which do not appear to have especially attracted the attention of the profession.

These effects, as presented to us under certain circumstances of its administration, may be conveniently considered in the following order.

I. The supervention of Puerperal Convulsions in the mother as its remote effect.

II. The production of the true Hour-glass contraction of the uterus.

III. Its tendency to produce Hydrocephalus in the early stage of infantile life.

I. In relation to the first, it has been well remarked, that in all cases where the ergot does not induce its specific action on the uterus, it is found to give rise to more or less constitutional derangement, varying in its seat according to collateral predisposing circumstances. To the truth of this remark every one must assent, however little accustomed he may be to observe the very curious and interesting action of this substance. That this must, in part, be the explanation of the first of the following cases of puerperal convulsions coming on under its influence, will, it is presumed, be sufficiently apparent.

Case 1.—Mrs T., a female of leucophlegmatic habit and lax fibre, with excessive dropsy of the lower extremities, was taken in labour with the ninth child in January 1835. The uterine contractions, as had been the case in all her previous confinements, were for twelve hours exceedingly feeble and inefficient; there was an extremely flabby state of the *os uteri* with natural presentation. The ergot was given in two doses of half a drachm each at intervals of twenty minutes without the slightest effect on the uterine fibre. Shortly after the administration of the second dose, the symptoms of troubled vision and deafness came on, accompanied by very marked stupidity of expression, and fixedness of the eye, followed in a few minutes by general convulsions of all the extensor muscles, and indeed by a perfect access of puerperal convulsion under its peculiar form. Delivery was with great facility accomplished by the forceps; yet the convulsions continued with more or less violence for five or six minutes afterwards, but did not again occur. Blood was removed from the arm. The child when born was in a state of perfect jaundice, and continued so until death, which took place on the second day.

Case 2.—This was complicated with an arm presentation, which, having been mistaken by an inexperienced assistant for a footlet case in its early stage, the ergot was administered in the full dose of one drachm. Its action, when the patient was visited, had set in with violence, and convulsions came on during the operation of turning, which was effected with much difficulty in half an hour. During this period the patient was copiously bled, and upon the extraction of the child, the convulsions gradually subsided. The child was still-born; but, from the appearance of the cuticle, it must have been some time dead. The waters had been evacuated four days previously.

The subsequent history of this case was remarkable, in as much as it was followed by inflammation and abscess in the neighbourhood of the uterus, or probably of the organ itself, which, after a narrow escape on the part of the mother, terminated by communication with the rectum.

In the leucophlegmatic temperament, and in the large infiltration of the serous tissue of the first case, may be fairly recognized a collateral cause of the action of ergot on the brain, as we find this admitted by many authorities as one of the predisposing causes of puerperal convulsions. In the late excellent work of M. Cazeaux of Paris, it is particularly alluded to as one of the more prominent. The passage may be cited. " Parmi les causes prédisposantes on a cité, un temperament lymphatique, comme rendant plus facile l'infiltration sereuse du tissu cellulaire, si commune chez les femmes enceintes, grace à la gêne que le developpement de l'uterus apporte dans la circulation générale, mais plus particulièrement dans celle des membres inferieurs." It is further added, " L'œdeme considerable des membres inferieurs, mais surtout l'infiltration générale qui envahit tout le tissu cellulaire sous cutané: Il n'est pas facile d'etablir le rapport qui peut exister entre les phenomenes convulsifs et cette infiltration ; mais il suffit de lire les observations consignées dans les auteurs pour se convaincre de son influence sur le développement de l'eclampsie."

It might be argued in the present instance, that this predisposing cause, here distinctly marked, might in itself have sufficed to induce convulsion, independent of the ergotic influence; yet the fact of this lady having borne eight children under circumstances almost identical, without any such untoward accident, will go far to bear out the original position.

The circumstance of the jaundiced state of the infant appears exceedingly interesting, and might well deserve more minute investigation.

In regard to the second case, although this state of the system did not exist, nor was there any other tangible cause to which to impute the attack, yet, as the convulsions were developed when the patient was under its influence, the case has been introduced for the purpose of illustrating another circumstance in connection with the subject, to be shortly noticed.

The following will illustrate more immediately the point upon which the inquiry was entered upon, viz. the presumed greater probability of its causing convulsion in those cases where its action is negative in respect to the uterus.

Case 3.—Mrs F. in the eighth month of her pregnancy, was taken in premature labour October 1, 1827. Her pains had been feeble for several hours; the waters had been evacuated on the preceding day; and the head had passed into the pelvis. The ergot was used in two doses of half a drachm each, without the least effect, except its inducing headach and a sense of nausea. The first of these symptoms became speedily more intense, and slight convulsion following, she was immediately delivered with the forceps without any contractile action of the uterus being brought into play. The placenta was extracted by the introduction of the hand, the womb being stimulated to action by kneading and friction of the abdomen. The child was still-born.

It may now be observed that Dr Stearns, an American practitioner, has insisted upon the employment of the ergot in cases where convulsions have occurred, and as a preventative in protracted labour when they appear imminent. If its effects, as they are generally recognized upon the cerebro-spinal and circulating system in the normal state of the economy are duly considered, it will be difficult to conceive on what ground this indication is presumed to be founded; the second case above detailed does not appear adapted to solve the difficulty.

In aiding the determination as to how far ergot was truly efficient in the convulsions of these three females, it may not be out of place to hint that seven-eighths of the cases of idiopathic convulsion are considered as occurring in first deliveries, or as taking place in those more especially who have been the subject of them in their preceding labours, in cases of twins, and when the uterus is greatly distended from an unusual quantity of the *liquor amnii.* None of these concomitants were present in any of the three cases that are now cited.

To this statement may be added a further quotation from that part of M. Cazeaux's work, in which the treatment of puerperal convulsions is considered. After having given the general indications, he continues in the following manner:

"Pendant le travail, l'accoucheur s'appliquera à prévenir l'influence de toutes les causes de dystocie; si les contractions prennent le caractère de douleurs irregulieres et tetaniques il s'empressera, par des bains, des opiacécs, la saignées du bras, la belladonne, de les ramener à leur type normal et régulier; car on sait que, pour une femme nerveuse et irritable, l'agitation excessive que produisent ces douleurs, est souvent le prelude de l'eclampsie."

Further, it is quite evident, from the perusal of the directions given by M. Cazeaux in regard to the treatment where this unfortunate complication has set in, that the use of ergot, although not alluded to, is to be understood as inadmissible. The only possible explanation, therefore, that could be offered by Dr Stearns in support of his practice would be upon the principle of emptying the uterus with the least possible delay. Whether this may be expected to be safely accomplished by such means has been already shown.

II. We have now to investigate the second effect of ergot, as indicated in the outset, viz.

Its disposition to induce true hour-glass or spasmodic contraction of the internal orifice of the uterine cavity, with incarceration of the placenta.

As under the preceding heads it was argued that the ascribed peculiar effects were the consequence of its influence under certain circumstances only, and not those of its general action, so, in relation to the peculiarity now to be treated of, the same restriction must be understood.

These may be defined as consisting in the lymphatic state of the maternal constitution; a nervous temperament, irregular and defective natural contraction of the uterus, constituting lingering labour, these not having been improved by the use of ergot, and this state connected with the previous death of the child *in utero.*

This concatenation of circumstances was nearly invariable in all its details, in the cases now to be described, and therefore offers a sufficiently precise definition of the required predisposition. This connected series is well known, furthermore, not to be one of the most unusual occurrence.

Case 4.—Mrs T. residing four miles from the residence of her medical attendant, was attacked with uterine pains on the 3d of August 1834; subsidence of the abdominal tumour, and partial discharge of the *liquor amnii* had preceded these for two or three days. She was found in a state of great mental anxiety, and entertaining a conviction that her delivery was at hand, the uterus having been suddenly evacuated in a former labour under similar symptoms. As but slight dilatation of the *os tincæ* was found upon examination, she was left for several hours. Upon being revisited in ten hours afterwards, the dilatation had somewhat advanced, and a drachm of ergot was then given in infusion. This was succeeded by slight and ineffectual but continuous contraction for two hours, without advance of the head. It was repeated in the same dose with the same result; the pains now entirely ceased for five hours and recommenced, apparently from natural action, in a very unsatisfactory manner, and these, in ten additional hours, brought the head upon the perinæum, when they a second time entirely left her. It was now evident that the child was dead, and had been so for some time. A third dose of half-a-drachm was had recourse to, and the delivery was terminated by the vectis. The child was in an advanced stage of putrefaction. Not the least effort could be traced to the uterus during delivery ; but, upon examination immediately after, its body was found to have taken on the most perfect contraction, the upper parts of its internal orifice embracing the chord as an iron ring, its lower portion lying in a state of extreme flaccidity upon the wrist of the accoucheur. The placenta was thus rigidly closed in for a period of fifteen hours, the spasm having resisted most completely during this period the several attempts at the introduction of the hand and the other means employed to reduce it. It was eventually overcome under the use of venesection and repeated opiates. Belladonna was not at hand, or it would have had a fair trial of its reputed powers. The circular contraction was resumed immediately upon the removal of the placenta, but in a more general form. Very slight hemorrhage attended the detachment of the placenta, nor were the lochia by any means of the usual amount.

Here are two drachms and a half of the ergot given under different indications in the progress of the case, and the exhibition followed by no evidence, either direct or indirect, of its action, until the abnormal type of spasm was induced, if we except the slight and continuous form of it which followed the first dose.

Case 5.—This, in most of its details, bears a close resemblance to the above. October 11, 1837, A. C. of the same constitutional habit, and in whom labour had proceeded with great sluggishness for eighteen hours, had four successive doses of half-a drachm each, administered to her within three hours with little sensible result. The labour was terminated eight hours afterwards. The pains having subsided, and having been again renewed at irregular intervals, the fibres of the internal orifice were found to have assumed the same form of contraction, and with as great intensity as in the preceding case. The placenta remained thus incarcerated without hæmorrhage for seven hours before its removal could be effected. The child was dead and the cutis reddened.

Case 6.—Mrs T., who formed the subject of the first case, was again in labour in the month of September 1835. The same inertness and want of energy on the part of the uterus obtaining, the state of the discharges indicating also the death of the child ; irregular pains with little progress continued for fifty hours, alternating with intervals of perfect remission, when ergot was given in a full dose in the form of tincture. The same general uneasiness was expressed as having been experienced from its administration on the former occasion, but beyond this its effects appeared null. An equal quantity was taken at the expiration of an hour, and it would have been a third time repeated, but for the complaint of a considerable sense of heat and fulness in the head. The child was removed eight hours after the second dose, and the " hour-glass" contraction again encountered in its most perfect form. This continued eleven hours and upwards before the placenta could be removed.

Case 7.—A pauper, of exceedingly delicate fibre, and who had been the subject of very serious hæmorrhage in two previous deliveries, was taken in labour with her fourth child at 8 o'clock A. M. February 6th 1838. Slight hæmorrhage and feeble contractions taking place, with head presentation and a dilatable state of the *os uteri*, the ergot was given in doses of two scruples every quarter of an hour to the extent of two drachms. The hæmorrhage ceased after the second dose, but this was the sole sign of its activity. The labour continued tedious in the extreme, and was only brought to a close on the following day. The child was still born. A fresh dose of two scruples was given just before the expected extrusion of the head, with the hope of correcting the known tendency to hæmorrhage, and the three or four weak contractions which followed sufficed to determine the peculiar contraction of which we treat. A small portion of the edge of the placenta was included, as well as the chord within the spasmodic ring. This yielded to opiates in a comparatively short period, a normal contraction appearing to succeed. No extent of discharge was sustained.

CASE. 8.—Mrs W. was attacked with all the symptoms of lingering labour. After sudden discharge of the waters had taken place two days before, some pains were present, but of that type having little effect on the advancement of the parturient process; and further remarkable for their irregularity. Ergot was given for the purpose of effecting a change, but without bringing on proper expulsive action. Somewhat of the continuous form was assumed for a short time, which gradually appeared to expend itself and pass off; irregular and weak contractions then followed for a protracted period; and the child was still-born 70 hours after the loss of the waters. The womb assumed the "hour-glass" contraction in an equally distinct form as in the former cases.

Three other cases illustrative of the powers possessed by ergot, of inducing this effect, and in a manner equally unequivocal, might be offered; but as they are very analogous to those already given, and to each other, the eight cases may be taken as presenting so great a similarity in all their phenomena as to admit of no doubt, that this anormal action of the uterus may be anticipated whenever it is administered under similar circumstances.

Irregular or spasmodic contractions of the uterus have been considered as occurring more or less under one or other of four forms.

1. In that of irregular contractions of the body.
2. In irregular contraction of its external orifice.
3. In the "hour-glass" contraction or spasm of the internal orifice;—and
4. In spasmodic contraction of the entire womb.

The first form presents several varieties of very usual occurrence under ordinary circumstances, and several of these have also been remarked in connection with the use of ergot.

The existence of the second form appears doubtful. As such it is, at any rate, considered by M. Velpeau, nor does it here demand notice.

The third is the form which we have just considered, and it is one of rare occurrence in the ordinary course of parturition.

In illustration of the fourth form, an excellent modern authority, M. Stolz of Strasburg, cites a case in which the repeated exhibition of ergot produced, after the birth of the child, violent and permanent spasm of the whole uterus, incarcerating the placenta. The delivery for seventeen hours was found wholly impracticable. This appears to have resisted opiates for a length of time, and eventually to have given way to repeated injections of belladonna and henbane. This case of spasmodic action, implicating the entire womb, appears to be considered a rare one; but it will be found otherwise where ergot has been employed, and in such cases associated with the plethoric habit.

The causes determining these several irregularities of action are admitted to be obscure; they have been frequently traced to undue traction on the chord and to the abuse of stimuli, and we are surely justified in specifying that of the ergot of rye. M. Stolz presumes the existence of predisposition on the part of the uterus itself as tending to facilitate its taking on the spasmodic orgasm. It may be stated in relation to this remark, that the subject of the first and third of our cases was also that of the seventh in June 1837, where on this third occasion predisposition may be almost admitted as the exciting cause.

It may be further noticed in regard to traction on the chord, that, in the eight cases no traction of any description had been employed, and in none of them was the neck of the child encircled by the chord, so frequently the cause of irregular subsequent action. The effect appeared wholly due to the specific influence of the ergot.

III. Before proceeding to the consideration of the subject under the third head, it may be well to prefix a short detail of some of the cases from which these effects have been assumed. They are from notes committed to paper at the time, the earlier ones taken previous to their accumulation having fixed attention to the specific cause.

Case 9. Mrs S. on the 21st of January 1827, was taken in labour with her third child; the first symptoms came on at 6 A. M. These progressed in the usual manner until 9, when there was a sudden cessation of pain, the *os uteri* being fully developed, and the passages in every way prepared for the transit. This being considered an eligible case for the administration of the ergot, it was given in the form of twenty-five grains of the recent powder in infusion. A continued general movement of the uterine fibre soon manifested itself but without expulsive effort; (a very frequent mode of action which will be subsequently noticed.) Upon the expiration of twenty minutes, a similar dose was had recourse to, upon which the proper expelling process followed, and in ten minutes the birth was accomplished, the child being in a state of asphyxia, which was quickly relieved by allowing the exit of a small portion of blood from the fœtal extremity of the chord. On the 27th of the following month this child was attacked by vomiting; considerable puffiness of the epigastric and umbilical regions, with emaciation, were also present. It was treated as a mere derangement of intestinal secretion, although, upon subsequent and more close investigation, there was evidence of the child having exhibited occasional stupidity of countenance, screaming, rolling of the head and other unequivocal symptoms of hydrocephalus. Death took place from sudden coma and convulsion on the eighth day.

Case 10. On the 3d of May 1828, the wife of a mechanic was delivered of her second child at 8 P. M., the commencement of the labour being at 5 A. M. In this case ergot was administered, the natural uterine action being present, only in consequence of the insufficiency of its expelling power: the first dose being given at 6 P. M., and repeated with but slight improvement of effect in three following and similar doses at intervals of the half-hour. Shortly subsequent to the last dose, the labour in the interval having made but little improvement, the child was expelled in a partial state of asphyxia. This infant died at the conclusion of the third week, in a state of coma and concomitant convulsion.

Case 11. Mrs K. of very robust habit, and pregnant of her second child, had a half-drachm dose of the ergot administered to her at 10 A. M. on the 2d of January 1829, at an undue and very early stage of her travail. Upon visiting her at 1 P. M. the uterus was found under the full and violent influence of the drug, which was effectually resisted by extreme dryness and rigidity of passage. Venesection and subsequently an opiate were employed with but little counteracting effect; and these forced uterine contractions continuing, she was delivered at 2 P. M., the child having been under the influence of this action for nearly four hours. Section of the chord, inflation of the lungs, the warm bath, and other external stimuli, were assiduously employed for ten or fifteen minutes previous to full inspiration. Decided symptoms of subacute meningeal inflammation were in this case developed on the nineteenth day, and convulsions with coma, were the termination on the thirty-second. In this case, it may be further remarked, that the lochia were exceedingly scanty, the delivery having been followed by incessant and distressing after-pains, which only yielded to a second bleeding, and several opiates.

Case. 12.—October 15, 1831. This was one of placental presentation where delivery was effected by turning; a rather smart hemorrhage coming on at 2 A. M., without uterine action, although this had been slightly marked on the preceding day, a full dose of ergot was given immediately preceding the operation. The feet and nates were brought through the *os externum* in sixteen minutes previous to the action of the ergot, which then set in with excessive violence, this being no doubt aided by the stimulus of the hand *in utero*. The head, from its large size, was delayed an additional ten minutes, but the chord having been protected as far as possible during the descent, the child was eventually saved under lengthened efforts at resuscitation. This infant was suddenly attacked on the 21st day, after suffering from the birth with a disordered state of the intestinal canal and biliary secretion, with stupor, squinting, and other symptoms of cerebral derangement, which terminated its existence on the third day of the attack by a succession of convulsive paroxysms.

This having occurred at an interval of more than two years after the three former cases, the attention was still not directed to the probable influence of ergot on its fatal termination. The following, in which the phenomena of hydrocephalus were more distinctly marked, and in which the analogy of the earlier symptoms with those of the preceding, were sufficiently striking, at length aroused a studious observation of its progress, and pointed pretty unequivocally to the cause of the mischief. The short interval that had elapsed was also favourable to the comparison.

Case 13.—December 22, 1831. A workhouse pauper, of lax fibre, in travail with her seventh child, had two scruples of the ergot administered to her in the second stage of labour, in consequence of the sudden cessation of pains, which interruption had continued two hours. The *os uteri* being fully dilated and soft, and the waters having been evacuated four hours previously, it was almost immediately followed by that peculiarly constant and inefficient action in which the *os uteri* is generally implicated, and the expulsive progress much interfered with. This state continued to the great discomfort of the patient for more than an hour, when a moderate opiate was given, which procured a slight alleviation of this irregular action, and in half-an hour afterwards with but little warning, the child and placenta were extruded together. This infant could never be induced to take the breast, and although a large and fine child, it gradually declined in health by emaciation and imperfect function of the skin, which assumed the dusky hue; irregular state of the bowels with stringy mucous discharge, dimness of the eye, and flaccidity of muscle. These symptoms proceeded and were now accompanied by much heat of skin and constant irritability. After six or eight days, this being the commencement of the third month from birth, vomiting supervened with much screaming, squinting, and a state amounting to lethargy, ending in complete coma and death. During the latter stages the little patient was treated on the antiphlogistic plan, and by purgatives, as far as the age would admit, but with no alleviation of symptoms or arrest of the fatal event.

It was much regretted in this as well as in the former cases that no opportunity was afforded for a *post mortem* inspection, as this seems to be alone wanting to complete our chain of evidence.

The five cases here brought forward occurred in a number somewhat exceeding 1000 where the ergot was had recourse to, probably in 200 or rather less; and upon an impartial view of these, the inference is tolerably direct, that, although it may, in an exceedingly large proportion, have had no such deleterious influence, yet the possibility of its having done so in those cited is far from problematical.

It will be seen, that of the above there are none connected with a first delivery, or any in which the child was subjected to very lengthened or forcible impaction. Is there any warrant from this fact to infer that the ergot had here exerted any specific influence upon the fœtal constitution, as alluded to by Dr F. H. Ramsbotham, independent of the extra-mechanical pressure induced by its action?

It becomes, indeed, a very interesting question, if it be admitted that ergot has an agency in the cerebral disturbance thus set up in the infant economy, to determine in what manner it is effected; whether, as above hinted, it be a purely mechanical effect, or occurring through the medium of direct absorption into the fœtal system. The short period which was allowed in its operation in the cases adduced, militates against this conclusion, but by no means renders it impossible. The effects that ergot is admitted to exert on the cerebro-spinal axis, are generally stated to be those constituting the leading symptoms of narcotism, viz. dila, tation of pupil, giddiness, delirium and stupor, and this might-with no great latitude of argument, be insisted upon as probably opening up a sufficiently morbid action to constitute predisposition.

It was not originally intended to enter generally into the merits or demerits of this very remarkable agent, the subject having been so variously and fully discussed, yet a short review may be, nevertheless, taken of some of its more prominent effects.

Ergot is so truly protean-like in its multifarious modes of action as to bid defiance to any certainty of prognosis of the manner in which it will act in any particular case, and it is from this circumstance alone that it can never possess the confidence of the obstetric practitioner.

Its primary action may be viewed as threefold;

1. It will powerfully aid in many instances existing uterine contraction, and determine the birth in a few minutes, where, had the uterus been left to its own resources, an indefinite period might have been required.

2. In other instances it will bring on what has been more than once alluded to in this paper, a peculiar continuous action, which, instead of assisting, would appear rather to antagonize the natural conditions, breaking through their regularity and destroying the interval. There is no doubt that this is an effect precisely analo-

gous to that considered in the fourth variety of irregular spasmodic contraction, occurring after the expulsion of the child.

3. It will be totally or nearly inert in regard to the uterus, and it is under these circumstances that its remote effects are most likely to present themselves.

We may next consider its effects on the child.

Instances are undoubtedly on record where it has clearly destroyed the infant. It may be well to consider the probable mode in which this is accomplished. In cases where the child has lost the protecting medium of the *liquor amnii*, and where the ergotic action shows itself in its second form, it is highly probable that the death is produced by the direct pressure on the cord, as there appears evidence to the effect, that, under such circumstances, every portion of the fœtal surface is subjected to a direct, powerful, and increasing pressure, every uterine fibre takes the direction of the organ's centre, and thus nature's beautiful provision of the dilatation of the lower portion progressively accommodating itself to the contraction from above, becomes entirely subverted.

In cases where the chord has been protected by the presence of the waters almost till the moment of expulsion, this explanation cannot be advanced. But the partially asphyxiated state of the child at birth, (by no means an uncommon occurrence under the second form of the ergot's action), would point to the existence of some deleterious cause of which, most probably, the asphyxia may indicate only the commencement of its effect, and which, if continued, would have been fatal.

On the other hand, it is well ascertained that in many hundred cases the child, *cæteris paribus*, appears to have been beyond its influence.

Its ultimate effect in the probable production of hydrocephalus has already been discussed.

In relation to its actions on the maternal system ;—

A general view having been already taken of the more remarkable of these in the course of this paper, and, as the various physiological effects of the drug on the general economy have been very ably treated in this Journal, by Dr Samuel Wright, this part of the subject does not call for further elucidation.

In forming an estimate of the true value of the ergot as applicable to obstetric practice, we may deduce from the facts before us, the following conclusions:

1. That it is a substance of energetic power, and, when judiciously used, of corresponding value.

2. That its employment in the stages of labour antecedent to the birth of the child is generally contraindicated, very few complications then existing in which recourse to it would be warranted on sound principles.

3. That, on the contrary, in the latter stage of parturition, it may be employed with safety and tolerable certainty to fulfil some important practical indications.

There further remains but to examine these three propositions; and *first*, that it is an energetic agent.

In three cases, the notes of which have been preserved, it accomplished complete delivery in the short space of a quarter of an hour, the dilatation of the *os uteri* not exceeding the circumference of a shilling, and the head lying above the pelvis at the commencement of its action. In a fourth, one of first pregnancy in a young and healthy subject, the labour was brought from an equally early stage to the same rapid conclusion in somewhat less than twenty minutes.

With these facts it would be useless to deny its occasional extraordinary activity.

Although not directly bearing upon this subject, a final case may be here quoted, in which it would appear to have exerted some influence upon the reduction of a retroverted uterus.

Case 14.—A lady having just completed the fourth month of her pregnancy, was seized with the usual symptoms of retroversion, which were stated to have already existed three days. Upon examination the uterus was found fully retroverted and very forcibly impacted, resisting powerful manual efforts at reduction. Ergot was given in eight doses at moderate intervals, with the expectation that, should uterine action be brought on, the capacity might be temporarily diminished and so assist the reduction. Some slight effect appeared to be induced in the course of five hours, and the uterus was replaced by a similarly employed force. That this fortunate result was due to the ergot is not advanced, great force having been ultimately necessary; but that it had some share in the reduction was my impression at the time. The instances in which it has been known to induce uterine contraction where no natural action or the period of labour were present are certainly rare; yet may it be supposed, in cases of retroversion, to have its influence more readily directed to the womb, when in a state of irritability, or even of incipient inflammation, the natural consequence of its new position.

Secondly, that its exhibition in the early stages of labour is injudicious and scarcely warrantable.

Let us examine upon what ground this proposition may lay claim to the force of an axiom.

In nine cases out of ten where ergot has been used in the early stages of labour, it has been so, more with the view of economizing time on the part of the accoucheur, than from any indication which has arisen from the particular case, from the idea, that in all cases where a dilated or dilatable state of the *os uteri* with natural action and consistent state of the passages are present, this drug may be safely employed; and upon this assumption it has been administered to thousands.

Again, in nine-tenths of the cases where it has been so administered, the object has been gained, either without any injurious consequences, or mere inertness of the drug has obtained; but in the decimal, its effects upon the child or mother may come under one or other of the heads of pernicious effect that have been here shown. The possibility of such an occurrence should cause every conscientious practitioner, acting under such motive, to pause ere he trusts the well-being of his patient or her offspring to so treacherous an auxiliary.

The only admissible case, then, will be, where there is serious hemorrhage from partial detachment of the placenta, accompanied by deficient uterine tone.

Thirdly, that in the latter stages, it may be of essential service in checking hemorrhage from whatever cause. Thus, in atony of the uterus, whether occurring from the presence of twins, its too sudden evacuation, or constitutional inertia of the organ, the ergot of rye affords a most unexceptionable and valuable resource. We have no instance where its exhibition, in these circumstances, has been injurious to the mother. The worst that has arisen has been the occasional spasmodic contraction of which we have treated, which, although inconvenient at the moment, has still, when given with the above object, fulfilled the end without ulterior mischief.

ART. VII.—*Analytical Account of the Researches and Rectifications in the practice of Auscultation and Percussion, made by* DR JOSEPH SKODA, Teacher of Clinical Medicine in the Hospital of Vienna. By JOHN DRYSDALE, M. D. and JOHN R. RUSSELL, M. D.—(Concluded from Vol. lvi. p. 103.)

On the Sounds of the Heart.—Dr Skoda first considers in detail the various theories which have been proposed to explain the production of the sounds of the heart, and the experiments on which some of these have been founded, and while he entirely dissents from the explanation of Hope, Burdach, and others, he partially agrees with those given by Magendie, Williams, the Dublin Committee of the British Association, &c; and then proceeds to develope his own views, which, it will be seen, are fundamentally the same as those of Rouanet and Bouillaud, although differing in some important particulars.

To obtain a solution of the question as to the origin of the sounds heard in the region of the heart, mere vivisection will not alone, he thinks, suffice; but observations on healthy and diseased individuals, and a careful comparison of the phenomena observed during life, with the results of examination after death, are requisite. The sounds arising from the motions of the heart have not the same degree of distinctness and clearness in different individuals, although quite healthy; in one, they are not sharply marked, and scarcely to be heard, while in another, they are very clear; in one, they can scarcely be perceived in the region of the heart, in another, they may be distinctly heard almost over the whole anterior surface of the chest. In many individuals these sounds are heard most distinctly at the point where the heart beats, while in others they are only feebly heard at this spot, and more distinctly over the aorta and pulmonary artery. If the sounds heard at the point where the heart beats be compared with those heard above the base of the heart, at the part under which the aorta and pulmonary artery lie, it will often be remarked that towards the apex of the heart the first sound (*i. e.* that synchronous with the beat of the heart) is longer than the second, while, above the base of the heart, this relation is reversed. On comparing the sound heard at the spot where the apex of the heart strikes the chest, that is, over the left ventricle, with those heard under the sternum, in a line with that spot, *i. e.* over the right ventricle, it will sometimes be observed that the sounds differ in strength and clearness at these two points. Finally, in auscultating above the base of the heart, on the right side of the sternum, somewhat above its middle, *i. e.* the spot under which the aorta runs, the sounds will be sometimes heard different in strength and clearness from those heard in a line with this point about an inch on the left side of the sternum, *i. e.* over the pulmonary artery. These differences in the sounds, which are not unfrequently quite perceptible in healthy individuals, become much more distinct in the various morbid conditions to which the heart is liable. Those who have frequent opportunities of examining cases of disease of the heart, will meet with instances in which both the normal sounds are entirely wanting in the part of the chest corresponding to the left ventricle, and their place supplied by a single or double abnormal sound resembling blowing, sawing, rasping, &c.; while to the right of this, over the right ventricle, and above the base of the heart, over the aorta and pulmonary artery, both the normal sounds are heard quite distinctly. In other cases, the sounds may be normal in the left ventricle, in the aorta and pulmonary artery, while they are replaced by a bellows-sound in the right ventricle. Still more frequently are cases met with in which a single or double bellows-sound is heard in the part corresponding to the course of the aorta, while both the normal sounds are heard distinctly over the right and left ventricles, and over the pulmonary artery. It also happens that a single or double abnormal sound may be heard over the aorta and left ventricle, while the normal sounds are heard over the right ventricle and pulmonary artery; or there is heard an abnormal sound over both ventricles, or over the right ventricle and the aorta, or over both ventricles and the aorta, while in the spots where no abnormal sound is heard the normal sounds may be distinctly perceived.

If these observations are correct, then it follows that the right and left ventricles, the aorta and pulmonary artery are each, independently, capable of producing both the sounds heard in the region of the heart.

On comparing the observations during life with the results of dissections, it is almost always observed that abnormal conditions of the valves,—such as, excrescences, thickening, narrowing of the orifices, are formed in cases which have presented, during life, the alterations of the normal sounds described above. Yet it cannot be denied, that occasionally the valves are found not quite normal after death, in cases which presented no alteration of the sounds during life. This shows that it is not every change in the valves that is capable of producing a sufficiently perceptible alteration in the sounds; or that other circumstances must co-operate with the affection of the valves in producing alteration of the sounds. These facts render necessary a more detailed examination of the structure and function of the valves in the healthy as well as in the morbid state.

Action of the tricuspid and mitral valves during the motions of the Heart.—Dr Skoda here directs attention to the mode of distribution of the *chordæ tendineæ* on the tricuspid and mitral valves, which, though previously overlooked, is of so much importance, that, without taking it into account, we cannot form an accurate idea of the precise mode in which these valves prevent the reflux of the blood into the auricles. We may, therefore, enter somewhat more fully into his description of the anatomy and function of these parts.

From each *columna carnea* run several stronger fibres *(cordæ tendineæ)* to the middle of the ventricular surface of the valve, and are inserted there, or some of them go to the base of the valve, and are inserted at the point of junction of the valve with the wall of the ventricle. From these stronger fibres, about their middle, and partly also from the *columnæ carneæ* arise finer fibres, which are inserted nearer the free edge of the valve. These finer fibres serve as points of attachment to still more delicate ones, which are inserted nearer and into the free margin of the valve. By pulling the *columnæ carneæ* in the direction which they have in the heart, it will be seen that only the stronger fibres, which spring from the *columnæ carneæ* are stretched; both the other kinds remaining relaxed, even with the utmost force we can exert. By thus pulling we never can stretch the free edge of the valve, but only the part of it between its attachment and the point of insertion of the tendinous fibres, which arise in the *columnæ carneæ*; the whole of the rest of the valve, *i. e.* from the middle to the edge, remains relaxed. If we press back, in the direction of the auricle, any point of this loose part of the valve, so as to stretch the fibres that are inserted into it, a number of pouches are disclosed to view, and on further examination the whole ventricular surface of the valve, from the free edge to the middle, is found to present similar pouches, which are obviously formed by the peculiar mode in which the tendinous fibres are inserted. These pouches represent, as it were, small semilunar valves, and the tri and bicuspid valves present the appearance of a combination of a vast number of small semilunar valves, which are kept in their proper position by the tendinous fibres. By blowing or pouring water on the valve, this loose part is blown up like a sail, and the whole of the pouches are seen at once. During the contraction of the ventricle, when the blood tends to flow back into the auricle, it necessarily catches in these pouches, and thus spreads out the loose part of the valve as far as the tendinous fibres permit. By means of this expansion of the valve, the blood prevents its own reflux into the auricle, provided that the valve is held in such a position by the fibres that no opening remains upon its expansion. And to secure this, as is well known, the *cordæ tendineæ* take their origin from the *columnæ carneæ*, in order that they may present the same relative length during the contraction of the ventricle.

In order that the tricuspid and mitral valves may perform their function properly, they must display the above described pouches at the free edges, and the *cordæ tendineæ* and *columnæ carneæ* must have a length corresponding to the size of the ventricle. If the valve deviate from the normal conformation, then it is either unable to prevent the reflux of the blood into the auricle, or it offers resistance to the flow of the blood from the auricle into the ventricle during the diastole of the latter. The first of these is produced by thickening and shortening of the free edge of the valve; or by its adhesion to the finer tendinous fibres, thus producing obliteration of the pouches; or by shortening, lengthening, or laceration of the *cordæ tendineæ* or by deposition of excrescences, &c. on the edge of the valve; the second, by considerable excrescences, blood coagula, calcareous concretions, &c. on the auricular surface of the valve; or by adhesions of the *cordæ tendineæ* to one another, or to the free edge of the valve which prevent it from being freely opened.

Explanation of the Normal Sounds in the Ventricles.—The comparison of the observations made on patients with the results of dissection, have shown that a distinct first normal sound is almost never heard in the left ventricle, when the mitral valve is incapable of hindering the reflux of the blood into the auricle during the contraction of the ventricle, *i. e.* when it is imperfect. In such a case, there is heard an abnormal sound simultaneous with the systole of the ventricle; while at the same time a distinct normal sound can be heard in all the other parts of the region of the heart. The same may be observed of the right ventricle. The first sound which is heard during the systole of the ventricle, arises from the interruption of the stream of blood, from the shutting of the mitral and tricuspid valves, and depends upon the *columnæ carneæ* and *chordæ tendineæ* being thrown into vibration by the sudden closure—by the blood in the ventricle—of the mitral and tricuspid valves, and the reason that the sound is prolonged is, that the vibration continues as long as this state of tension is maintained. This explanation fully accounts for the prolonged character of the sound, for cords when suddenly stretched will vibrate for a considerable time, if the tension be continued, and may emit a clear or even ringing tone resembling the one which characterizes the first sound of the ventricles, and wholly unlike that produced by the contraction of muscles, which is always dull and indistinct.*

The explanation of the second sound in the ventricles is a point of much greater difficulty. It cannot be said that, in the normal state of the heart, a second sound always originates in the ventricles, since it is certain that the second sound heard in the ventricles is generally that transmitted from the semilunar valves. But there certainly are cases in which we are obliged to admit the origin of the second sound in the region of the ventricles themselves, viz. when the second sound is scarcely heard at all, or very weak, over the base of the heart, while it is heard clear and loud at the apex. Dr Skoda thinks that none of the theories of the sounds of the heart afford a satisfactory explanation of this, and therefore leaves it quite doubtful; although he thinks it probable that it may originate in the sudden detachment, during the diastole of the ventricle, of the apex of the heart from the parietes of the chest, when it is covered with somewhat viscid effusion.

Explanation of the sounds in the arteries.—In the pulmonary artery, aorta, carotid, and subclavian arteries, sounds are usually heard exactly similar to the normal sounds of the heart. These have been usually ascribed to the propagation of the sounds of the heart along the arteries; but Dr Skoda believes, for these reasons, that they have their origin in the arteries themselves. 1*st*, In certain rare cases a sound can be heard in all the larger arteries precisely similar to one of the normal sounds of the heart;

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* Dr Skoda here notices, that a sound quite similar to that over the left ventricle may sometimes be produced, by the stroke of the apex of the heart against the walls of the chest, but does not lay any practical weight on it.

and no one has thought of ascribing such sounds heard in the brachial or crural arteries to propagation of sound from the heart. *2d*, Sounds are frequently heard in the carotid and subclavian, while the normal sounds are either not heard at all in the heart, or very much weaker than in the neck. It has been attempted to explain this by referring it to a peculiar mode of conduction of the sounds on account of some abnormity in the organs of the chest; but cases of this kind are common enough, where the lungs have been found quite healthy. Bouillaud also believes that the arteries may produce a sound, although not like the proper tic-tac of the heart, but one of an indistinct character. Skoda admits that, in the arteries more distant from the heart, such is frequently the character of the sound heard; but the nearer ones, viz. the carotid, subclavian, aorta, and pulmonary artery, give in general a tic-tac, just as loud as is heard in the region of the heart, while, on the other hand, the sounds in the region of the heart are sometimes also dull and indistinct.

The cause of the sound heard in the arteries synchronous with the pulsation, *i. e.* the first sound, is, according to Skoda, the sudden tension of the coats of the vessel.

The second normal sound is heard in the aorta and pulmonary artery, and usually also in the carotid and subclavian. It is obviously produced by the shock of the column of blood against the semilunar valves, which is communicated to the coats, not only of the aorta and pulmonary artery, but also, not unfrequently, to the carotid and subclavian.

On the varieties in the Normal Sounds.—These sounds may, even in the healthy subject, present a great variety of modifications, which it is unnecessary to enter into here, except to make the practical observation, that the more the sounds have the clapping sharp sound, the greater is the certainty that they are produced by the proper action of the valves. And if the sound heard over the ventricles is of an undefined, murmuring character, it is proper to denominate it an indeterminate sound, (as has been already done with respect to respiration,) and draw no conclusion at all from it.

On the Abnormal Sounds.—These have their origin within the cavities of the heart, within the arteries or in their coats, or in the pericardium.

On the Abnormal Sounds which arise within the cavities of the Heart.—These have been very variously denominated, according as they have been compared at different times by different observers, to the noise of a pair of bellows, a file, a saw, a rasp, &c. or they have been termed whistling or groaning, &c. The physical conditions necessary to the production of these abnormal sounds, are now generally admitted to be the friction of the blood against the walls of the heart and valves, caused by certain organic changes within the heart, viz.

1st, Imperfection of the tricuspid and mitral valves, or of the aortic valves.

2d, Contraction of the left auriculo-ventricular orifice, or of the aortic orifice.

3d, Roughnesses, as from excrescences, cartilaginous or calcareous concretions, or blood coagula, on the endocardium towards the orifice of the aorta, on the lower surface of the semilunar valves of the aorta or pulmonary artery, or on the ventricular surface of the tricuspid and mitral valves.

Many have believed that these abnormal sounds may be produced without organic change in the heart, *e. g.* by mere spasm, as conceived by Laennec. This is denied by Skoda. Andral maintains that abnormal sounds may be generated in the heart, as the simple effect of general plethora. Skoda denies that this can take place unless there previously existed some organic change which was too slight to give rise to abnormal sounds during the ordinary action of the heart, but which produced one whenever the action became increased in consequence of the plethora. It has likewise been asserted that abnormal sounds arise after great losses of blood, and in anæmia in general, when the action of the heart is lively. Skoda has repeatedly examined patients in whom a deficiency of blood, either from bleeding or from disease, was well marked, when the action of the heart was lively, and he thinks he has even examined patients who have died of want of blood; but he has never met with a case where abnormal sounds were dependent solely upon that cause. Likewise, the abnormal sound heard in chlorotic patients is not found in the heart, but usually only in the arteries of the neck. In the aorta it is seldom loud, and in these cases it can at times be heard over the heart, although only as a dull sound.

It has been observed, that in the same case of heart disease, the character of the sound frequently varies, and at one time a bellows, and at another a saw sound, &c. is heard, according as the action of the heart is more or less energetic; and often it is quite arbitrary how the sound is denominated, for, if several observers auscultate the same case, one will compare the sound to a file, another to bellows, &c. Dr Skoda therefore considers any subdivision of the abnormal sounds quite superfluous and of no diagnostic value, and comprehends them all under the general term "Geräusch," which has been here rendered "abnormal sound," and sometimes "bellows-sound," which, as most common, we employ as representing any abnormal sound, unless otherwise specified. The points of importance to know are where they arise, and whether they are synchronous with the systole or diastole, for upon these circumstances depend their value as diagnostic signs.

On the Abnormal Sounds in the Arteries.—All the different kinds of abnormal sounds which occur in the ventricles may be generated in the aorta. They are produced by excrescences, cartilaginous or calcareous concretions, &c. on the lining membrane of the vessel, attended with contraction, or dilatation, or normal size of its calibre. The state of the valves may likewise give rise to abnormal sounds, as when their lower surface is rough, when there are excrescences on the free edge, when they are rigid or adhering to each other, so that the stream of blood cannot press them quite back to the sides of the vessel; and when they are imperfect. Abnormal sounds in the pulmonary artery are of extremely rare occurrence.

Any notice of the various sounds in the other arteries in chlorosis, &c. would lead us into details inconsistent with the object of the present notice.

On the Pericardial Sounds.—When, from any cause, such as exudation of lymph, calcareous and other concretions, &c. the surface of the pericardium becomes rough, certain sounds are found to accompany the motions of the heart, either in the systole and diastole of the ventricles, or during the latter alone. It has been attempted by describing the different varieties of these sounds to obtain certain means of distinguishing affections of the pericardium from those of the heart. Bouillaud, in particular, has described three species, which he conceives to be peculiar to the pericardium, and capable of being distinguished from those which arise in the heart. Skoda has, however, found that these varieties of the rubbing sound certainly do occur in the pericardium, but also several more; and his experience has led him to the conclusion, that the rubbing sound in the pericardium may imitate every sound produced within the heart, with the exception of the whistling sound; and, on the other hand, every variety of the rubbing sound of the pericardium may occur within the heart. Likewise, the circumstance that a sound appears superficial or remote, is no ground of distinction; for a sound propagated through solid bodies appears quite superficial when it is loud, and *vice versâ*; and though a very loud bellows sound in the heart may often appear quite superficial, while a pericardial sound is often weak and dull, and therefore appears to come from a distance. There is nothing, therefore, in the character of the sounds themselves, or in their apparent distance, that enables us to determine whether they are produced in the pericardium or within the heart. The only direction that Dr Skoda can give for distinguishing them, is, that the abnormal sounds within the heart follow exactly the rhythm of its beat, and correspond to the normal sounds, while those in the pericardium appear to be somewhat postponed. But this test cannot be applied when the beat is very short. We must then rest the diagnosis on the other circumstances of the case, such as the indications afforded by percussion, the consecutive changes attending valvular disease, &c. Dr Skoda is further of opinion, that no sound can occur in the pericardium, until there is an exudation of plastic lymph, until, indeed, rough spots are formed on its surface—and that the motions must possess a certain degree of strength, for when they are too weak the surface of the pericardium may be covered with a thick and rough false membrane, and yet no rubbing sound be produced.

Indications afforded by the Normal and Abnormal Sounds in the Ventricles, Aorta, and Pulmonary Artery.—Before entering on this it may be noticed, that the left ventricle is to be auscultated at the spot where the beat of the heart is felt; the right generally at the inferior part of the sternum; the aorta a little to the right and above the middle of the sternum; and the pulmonary artery a little to the left of the middle of the sternum. The position of the right ventricle and pulmonary artery is variable, and can only be determined by that of the ventricles and aorta.

I. *a. In the left ventricle during the systole.*— *α.* The (first) normal sound without bellows-sound, indicates that the mitral valve closes, and thus prevents the reflux of the blood into the auricle.

β. Bellows-sound in the place of the (first) normal sound, arises from the imperfect closure of the mitral valve, and in this case it is caused either by the friction of the regurgitating blood on a rough spot of the margin of the valve, or by a stream of blood driven from the ventricle meeting one flowing in the opposite direction in the auricle; or from friction of the blood on rough spots in the neighbourhood of the aortic orifice, while, at the same time, the mitral valve may shut perfectly, or from a combination of both these conditions. In imperfection of the mitral valve, the pulmonary circulation is always overloaded, and obstruction afforded to the passage of the blood through the lungs, and hence follow increased action of the right heart, greater tension of the pulmonary artery, and consequently, preternatural loudness of the sound of the valves, *i. e.* the second normal sound heard over the pulmonary artery. Hence a bellows sound in the left ventricle during the systole does not indicate imperfect closure of the mitral valve, unless the second sound in the pulmonary artery be at the same time louder than natural. If the second sound of the pulmonary artery be not strengthened, the bellows-sound heard during the dystole in the left ventricle indicates roughness either of the surface of the valve, or of the lining membrane of the ventricle in the neighbourhood of the aortic orifice; for it is only here that the current of blood has a sufficient velocity to cause a sound.

γ. A bellows-sound accompanying the normal sound, affords *the same indication as a bellows-sound without the normal sound.* —For the normal sound may be produced by the perfect closure of the mitral valve, while a bellows-sound is at the same time produced by rough spots near the orifice of the aorta; or the normal sound may arise from the expansion of some of the pouches of the mitral valve which remain normal, while the imperfection of the rest gives rise to a bellows-sound.

δ. Absence both of normal and abnormal sounds is a phenomenon which gives no information as to the state of the mitral valve.—For the valve may shut perfectly, and yet the presence of circumstances which deaden the sound may render it inaudible. But there may also exist imperfection of the mitral valve, and yet no bellows-sound be present, if the current of blood do not meet with any rough spots, or is not sufficiently rapid. This happens, however, very rarely. In such a case the diagnosis must be rested on collateral circumstances, such as the state of the valves of the pulmonary artery, &c.

b. Sounds heard in the left ventricle during the diastole.

α. The normal (second) sound, without bellows-sound, indicates that the left auriculo-ventricular orifice is not contracted, and that the blood does not encounter any rough spots in its passage from the auricle to the ventricle.

β. Bellows-sound, either accompanying the normal sound or alone, indicates contraction and roughness of the auriculo-ventricular orifice, or rough and projecting spots on the auricular surface of the valve without narrowing of the orifice. In contraction of the auriculo-ventricular orifice, the obstruction of the lesser circulation causes even more rapidly than imperfection of the mitral valve, hypertrophy with dilatation of the right ventricle, and increased loudness of the second sound in the pulmonary artery. If there be merely roughness of the auricular surface of the valve without contraction of the surface, there is no increase of the loudness of the second sound in the pulmonary artery, unless it happens to be there already from other causes. The greater the contraction of the orifice, the longer and more sonorous is the sound heard; and when considerable, it may give rise to that thrilling sensation felt with the hand over the region of the heart, called by Laennec *fremissement cataire.*

γ. Absence both of normal and abnormal sounds affords no definite indication.

II. *a.* In the right ventricle during the systole.

α. The normal (first) sound without bellows-sound, indicates that the tricuspid valve closes perfectly, and prevents the reflux of the blood into the auricle.

β. Bellows-sound alone or accompanying the normal sound, indicates either imperfection of the tricuspid valve with rough spots on its free edge, or excrescences in the neighbourhood of the arterial orifice, while the valve closes perfectly: the latter, however, occurs very rarely. Imperfection of the tricuspid valve causes an accumulation of blood in the auricle, *vena cava*, and jugular veins, increased at each systole of the ventricle, and thus is produced the pulsation of the jugular veins. Imperfection of the tricuspid valve is thus indicated by a bellows-sound in the right ventricle during the systole, with simultaneous pulsation of the jugular veins.

b. Hitherto Dr Skoda has never met with an abnormal sound during the diastole of the right ventricle; and the narrowing of the right auriculo-ventricular orifice, if it ever takes place, must be an extremely rare occurrence.

III. *a*. In the aorta during the systole of the heart.

α. *The normal (first) sound without bellows-sound*, does not necessarily indicate a perfectly normal condition of the aorta, for it may be present in various abnormal states of that vessel, such as alterations in its capacity or thickening of its coats, which may influence the intensity of its sounds without affecting their character.

β. *Bellows-sound, with or without the normal sound*, indicates rough spots on the inner surface of the aorta, or on the under surface of the semilunar valves. But in chlorotic persons, the vibrations of the carotid or subclavian are sometimes propagated down to the aorta, and thus are abnormal sounds—usually only dull—and may be heard in this vessel without there being any roughness present.

γ. *Absence of sound, normal or abnormal.*—The same remark applies here as when this occurs in the ventricles.

b. In the aorta during the diastole of the ventricles.

α .*The normal (second) sound without bellows-sound*, indicates the closure of the aortic valves.

β. *Bellows-sound, without the normal sound, if it is prolonged and heard beyond the base of the heart*, indicates imperfection of the semilunar valves, with rough spots on their free edges. If the bellows-sound is only of short duration, or heard only high up in the aorta, it may arise merely from rough places on the inner surface of the aorta, without imperfection of the semilunar valves.

γ. *Bellows-sound, ending in a normal sound*, arises from the presence of rough places on the inner surface of the aorta, while, at the same time, the semilunar valves close perfectly.

δ. *Bellows-sound and normal sound heard together, but so, that the bellows-sound is prolonged beyond the normal sound.*—This indicates that the aortic valves are expanded by the column of blood, but they are not quite perfect, and the regurgitating blood produces a prolonged bellows-sound.

IV. *a*. Hitherto Dr Skoda has met with only three cases where a sound so prolonged as to be considered abnormal was heard in the pulmonary artery during the systole of the ventricles. But he had not the opportunity of ascertaining by dissection the cause of this.

b. During the diastole he has, as yet, never heard an abnormal sound in the pulmonary artery. The normal sound is strong in imperfection of the mitral valve, contraction of the auriculo-ventricular orifice as already mentioned; but it may also be strong without any such disease of the mitral valve, if there be hypertrophy and dilatation of the right ventricle, and lively action of the heart.*

ART. VIII.—*On the Pseudo-Morbid Appearances of the Brain and its Envelopes.* By ROBERT PATERSON, M.D., &c. Physician to the Leith Dispensary.

THE object of the present communication is to take into consideration the pseudo-morbid changes which take place in the brain and its envelopes.

These changes present themselves under the forms of colorations and softenings,—appearances with which, as arising from disease, every medical man is familiar; but which sometimes are noticed, and bearing a very marked character, when few or no symptoms have existed during the life of the patient, to give rise to the suspicion, that such a state of matters would have been found after death. In such cases, we shall find a ready explanation of the phenomena in pseudo-morbid changes.

During the course of a series of experiments on pseudo-morbid ramollissement or softening, as occurring in the brains of the lower animals, we had occasion to draw up a table showing the different parts of the brain which were successively affected with pseudo-morbid softening, and, upon comparing this table with others which were drawn up after a similar manner from the works of Abercrombie, Andral, Louis, Bright, &c., some striking similarities were noticed with regard to the parts which were first found softened from disease and from pseudo-morbid change.

This similarity at once suggested the idea, that, in consequence of this source of fallacy, some mistakes may have occurred; more especially with the authors in this country, as here the same facilities for the examination of dead bodies does not exist, and often a much longer time is allowed to elapse between death and dissection.†

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* It is proper to inform our readers, that a translation of the work of Dr Skoda into English by Dr A. Fisher of Dublin, executed under the eye of the author at Vienna, will in no long time appear in this country.

† Some of the authors in this country do not even mention the length of time which elapsed, which consequently gives us no room for judging.

It shall be our object to point out the circumstances connected with this source of fallacy, so that it may in future be guarded against.

We use the term pseudo-morbid in the consideration of this subject, not only as it has been employed by the most recent writers on these phenomena, but because it includes the many appearances, (unconnected with disease,) which may take place immediately before death, at the moment of dissolution, and subsequent to that event. The terms cadaveric, *post mortem*, pseudo-inflammatory, inflammatoidal, and M. Andral's cadaveric or *post mortem* hyperemic appearances have each been applied to the phenomena in question; but the term which we have adopted seems preferable to any of these, on account of its more extensive signification.

CAUSES OF PSEUDO-MORBID PHENOMENA IN THE BRAIN.

The causes which operate on the brain, and give rise to pseudo-morbid colorations and softenings are four in number.

I. *Obstruction in the course of the Venous Circulation occurring shortly before death.*—Cases of slow asphyxia furnish illustrations of this. Dr Bright has given a beautiful instance of it in a case of obstructed circulation through the large veins;* and M. Andral, speaking of his mechanical hyperemia, says, "Thus, in such a case, the brain, when sliced, presents numerous red points, which are nothing else than the divided orifices of the congested vessels."

II. *Gravitation of the Blood to the more dependent parts (the hyperemia by hypostasis of M. Andral).*—This cause comes into operation most frequently at the posterior parts, in consequence of the manner in which bodies are generally laid out after death. M. Andral believes that we may produce a coloration of the substance of the brain, by simply making the head more dependent than the body. This assertion is contrary to the statement of Drs Kellie and Abercrombie, and also opposed to experiments which I myself have witnessed on dogs which were suspended by the hind-legs, immediately after death. The blood was thus allowed to gravitate towards the head. But on comparing those animals with several others which had been suspended in a contrary direction, and where, of course, the blood was allowed to gravitate towards the posterior extremities, little difference was observed in the quantity of blood which the brains of each respectively contained.† The same fact is taken notice of by Dr

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* Bright's Medical Reports, Vol. ii. Part 1st, p. 6.

† My friends, Professors Reid and Simpson, who were present at the experiments referred to, were satisfied that little difference existed in the actual quantity of blood in the vessels of the brain. Although in the animals hung up by the tail, and where,

Kellie. Whether the result of these experiments is to be accounted for by the difference existing in the method by which the brain of the lower animals is protected from pressure, in consequence of their horizontal position, I am unable to say. But there can be no doubt that in the human brain, coloration is frequently produced by the gravitation of the blood to the depending parts; and it is obviously a most important duty to note the position of the head in the examination of bodies found dead, as well as in many other cases.

III.—*Extravasal transudation and imbibition of the Blood, or of some of its component parts after death.*—This is a cause which is well known to produce ecchymosed spots around the vessels of the scalp, and bloody-serous effusions in the cerebral and spinal arachnoid membrane; and we shall presently have to direct the reader's attention to another pseudo-morbid phenomenon resulting from it.

IV.—*Spasmodic action of the muscular system, occurring towards the close of life*, may be enumerated as another cause of the appearances which simulate the phenomena produced by disease. It operates during infancy, when the fontanelles are open, by pressing the blood into the cranial case from the rest of the body; and we shall have further occasion to refer to it as a cause of pseudo-morbid appearances.

Pseudo-Morbid Colorations.—Every medical man accustomed to the inspection of dead bodies must have felt the difficulty of determining, when the substance of the brain was to be considered in a morbidly congested state. Coloration in its various stages has frequently been observed, while the most careful inquiries have failed to detect the previous occurrence of corresponding symptoms; and too often, we believe, have pseudo-morbid injections been regarded as the effects of some inflammatory action supposed to have been going on in the brain.

The appearances which cerebral coloration presents are two in number, the spotted or the "injection sablée" of M. Lallemand, and the diffused or uniform. The spotted redness is allowed by all authors to be simply an increase in the number and size of the red spots which naturally occur. It is best seen in the medullary substance, while the diffused almost always occur in the cortical. The spotted redness is by far the most frequent pseudo-morbid appearance; and it is remarkable that it is also a much surer indication of inflammatory action. It is to be seen in those who die

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of course, the blood was allowed to gravitate to the head, there was such an enormous quantity of blood in every minute vessel of the external parts and bones themselves, that it was impossible to keep it from rapidly passing over and colouring the brain. This gave rise to very fallacious appearances, which, however, were easily proved to be so by taking a clean knife, and making a new slice of the brain, when its was seen of its natural colour; but very soon became red, from the causes formerly mentioned.

from slow asphyxia, from an impediment to the circulation in the right side of the heart, or in the veins of the upper part of the body. It also happens as a consequence of convulsions, when these take place before the fontanelles are closed. The brain is then exposed to pressure, not only from external agencies, but also from such as act through the circulation, without a corresponding external pressure. The violent muscular contractions of a convulsive attack force the blood along the arteries, and restrain the freedom of its passage through the veins proceeding from the head; an accumulation, therefore, takes place in the vessels and substance of the brain, which are beyond the influence of muscular pressure.

By such means, then, may spotted colorations be produced in the substance of the brain, resembling the results of the first stage of inflammation ; and all these circumstances must be taken into consideration, before deciding whether a congestion be the result of disease, or a pseudo-morbid phenomenon. In cases where a general appearance of congestion is found, it is important to note the kind of death the person has died, the quantity of blood in the system at the time of dissolution, the position of the body after death, the interval that has been allowed to elapse from death to dissection, the connection of previous symptoms, with *post mortem* appearances, and the concomitant presence of albuminous exudation, or any of the certain proofs of inflammatory action in the membranes, or any part of the brain.* "After all," says M. Andral, "this kind of redness can only be considered as decidedly the result of active hyperemia of the brain, when it is very well marked, and even then we must always allow for the kind of death the person has suffered." After due allowance has been made for all the circumstances of the case, and they are found insufficient to account for the presence of the coloration, it may then be pronounced the consequence of inflammatory action.

When the "injection sablée" occurs in particular parts of the brain only, or around an apoplectic effusion, the probability of the coloration, being the result of morbid action, is greatly increased. Such, however, is not the case with the diffused redness which is so often met with in the cortical, and occasionally in the medullary substance of the brain. This kind of coloration is very frequently seen surrounding apoplectic clots ; and every anatomist is familiar with it in the brains of subjects which are examined at a considerable interval after death. Occurring under such circumstances, we are inclined to place no reliance on it as a mark of diseased action. The mode of its formation is very simple. The substance of the brain, and especially its cortical parts, absorbs fluid with great facility; extravasal transudation of the serum and colouring matter of the blood goes on after death, and together with the cerebro-spinal fluid; they are absorbed by the substance of the brain, which thus acquires the kind of coloration under consideration. A similar explanation applies to the zone of diffused redness, which is so often seen around apoplectic clots, and which is produced merely by the absorption of the colouring matter and serum of the effused blood. That such is the case is easily proved by the introduction of coagulated or fluid blood (the latter is preferable) into the brains of the lower animals after death. The diffused redness appears in the cerebral substance surrounding the clot in the course of from eighteen to twenty-four hours after its insertion. This experiment we have repeated several times with the same result. The constant occurrence of a concomitant ramollissement in the red portion has been supposed to add to the likelihood of the diffused redness being a morbid appearance; but a similar softening is as invariably observed in the experiments to which we allude; and it is only what we would naturally expect to find when the serum of the blood has been taken up by the cerebral tissue. We are, therefore, not disposed to attach any importance to the fact, that diffused redness around an apoplectic clot is accompanied by ramollissement, and trust entirely to the spotted coloration (whether or not associated with softening) for the proof of morbid action. If the small dots of blood are so increased in size as to form smaller coagula or apoplectic clots around the larger ones, such an appearance may still more surely be regarded as a proof that the softening has been of an inflammatory nature, and has been previous to, if not the cause of, the bloody effusion.

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* For, according as the individual has died of a disease, proving fatal by slow asphyxia, or with a large quantity of blood in the system, has lain after death with the head dependent, or if a long time has been allowed to elapse between death and dissection, (or even a short time in warm weather), so must the appearances be judged of, and our opinion modified accordingly.

Pseudo-morbid Softening.—Ramollissement or softening* of the cerebral mass, has of late years attracted considerable attention; and we now proceed to consider whether softenings entirely pseudo-morbid may not be mistaken for those which occur as the result of disease.† Pale or white ramollissement of the nervous centres

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* The pale or white softening here referred to has been considered by some as a gangrene of the brain (Morgagni, Lieutaud, Baillie); by Rostan as similar to *gangrena senilis*; and by Recamier, as a change, *sui generis*. The white softening from putrefaction has undoubtedly precisely the same appearance, in every respect, as the white softening the result of disease.

† Softened portions of the cerebral mass are not unfrequently observed at *post mortem* examinations, which at once strike the examiners as being the result of disease, and yet no symptoms have been noticed during life to give countenance to the idea. They are, nevertheless, too frequently set down as the result of disease. Dr Copland, in considering softening of the brain, and in remarking upon the frequent want of connection between symptoms and appearances after death, says, "It should be kept in recollection, that this state of the cerebral structure, although often preceded by signs of inflammation, and exhibiting in the parts surrounding it inflam-

(according to M. Andral) presents several degrees. In the first, the change of consistence is perceptible only to the touch ; in the second, the nervous substance is so different, that the change is perceptible to the eye ; in the third, it is completely fluid, its texture being totally destroyed, and nothing appearing in its place but a kind of cellular structure, which seems to be the original frame-work of the part. In the fourth degree of softening, even this trace of structure disappears, and there is a complete solution of continuity. The softened portion may either preserve its natural colour, or assume a new one, as red, purple, brown, violet, yellow, greenish, &c. Pseudo-morbid softenings, on the other hand, only simulate diseased appearances in the earlier of these stages. They may or may not be visible to the eye, but are always discernible to the touch. The colour is in general not changed ; but M. Orfila has seen pseudo-morbid softenings assume all the varieties of colour mentioned above, as green, brown, &c. so that no distinction can be drawn from the colour of the softened portions, as to whether they have been produced by morbid or pseudo-morbid causes.

We have formerly mentioned that the brain speedily absorbs any fluid with which it may be in contact. This happens even when it is covered with its investing membranes, but to a greater extent when these are removed. The brains of sheep have been allowed to stand for a certain number of hours in a given weight of water, which was rapidly absorbed. The weight was proportionally increased, and the parts most exposed to the fluid were found in a softened state. In one instance the brain was deprived of its membranes on one side, and six hours after death it was immersed in a mixture composed of equal parts of ox bile and water. It weighed three ounces seven drachms and four grains when prepared for experiment. After remaining in the mixture thirty-six hours, it weighed eight ounces and one drachm. It had a dingy yellow colour, which was much deeper on the side where the membranes had been removed. On that side the yellow colour of the bile had penetrated the whole extent of the cortical substance, but nowhere was the medullary matter at all tinged. On the side where the membranes had been left entire, the subarachnoid cellular tissue was quite distended with yellow coloured fluid,* and the internal parts of the brain were in a very softened condition.

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matory appearances, is often neither preceded by the one, nor accompanied by the other, on the contrary, with a directly opposite train of phenomena and state of parts."

Such appearances often result, as we shall presently show, from pseudo-morbid changes.

* May not this imbibition of fluid into the subarachnoid cellular tissue take place immediately after death, and be one of the causes of serous effusion, being so often found in the arachnoid cellular structure, and so seldom in the sac of the arachnoid in cases of meningitis ?

The rapidity with which fluid is absorbed by the cerebral mass suggested a series of experiments, with the view of observing whether the parts in the vicinity of the cerebro-spinal fluid might not acquire a softening liable to be mistaken for the effects of disease. The brains of sheep and oxen were the subjects of our observations. The heads of these animals were procured from the market, all killed within an hour or two of each other. They were kept in a room, the temperature of which was from 50° to 56° of Fahrenheit. They were opened at stated intervals, and, from a minute examination, the following table has been drawn up:—

Interval between death and examination.	Parts softened.
1st, 36 hours,	Septum lucidum.
2d, 48,	Corpora striata.
3d, 60,	Commissura magna.
4th, 68,	Anterior part of fornix.
5th, 72,	Internal part of lateral ventricle.
6th, 84,	Cortical substance in general.
7th, 112,	Pons Varolii.
8th, 136,	Hippocampi.*

The softenings arising from decomposition, as mentioned by M. Orfila, are seen, 1*st*, in the *commissura magna*; *2d*, in the *septum lucidum*; *3d*, in the walls of the lateral ventricles.

The situation of the softenings noticed in this and the preceding tables is very similar, and they become most interesting when compared with other tables drawn from the works of authors who have written on morbid ramollissement of the brain. Thus, M. Andral, in order to illustrate the relative frequency of diseased softening in different parts, gives 169 cases from the works of different authors, 33 of which were his own. In these

Softening of the middle lobes occurred in	37
corpora striata,	28
anterior lobes,	27
posterior lobes,	16
optic thalami,	15
circumvolutions alone,	14
one hemisphere in its entire extent,	13
circumvolutions and other more deeply seated parts.	9
dispersed through different points,	5
of the entire hemispheres,	4
parietes of ventricles,	2
cerebral peduncles,	1

A point worthy of attention in reference to the foregoing table is, that, out of the 169 cases, softening took place

In the right hemisphere,	73
In the left,	63
In both,	33

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* Although in the preceding table we have mentioned the parts which had become softened from the date of each experiment, yet it is important to keep in mind that the parts mentioned in the first experiment, as being found softened, were always found softened (generally more so) in each succeeding one.

The following table has been compiled from Dr Abercrombie's table on the Diseases of the Brain and Spinal Chord. It shows the relative frequency with which he found ramollissement to occur in different parts.

In the septum and fornix, softening was found in	16 cases.
anterior, outer, and upper parts of hemispheres,	7
centre of hemispheres on a level with, and external to, the lateral ventricles,	6
internal part of ventricles,	4
corpora striata,	2
corpus callosum,	2
posterior part of one hemisphere,	1
upper part of both hemispheres,	1
lower part of one hemisphere,	1
both thalami optici,	1
all central parts,	1

Of 18 cases of white softening, or softening without change of colour, in 14 the *septum lucidum* was affected, and in 12 the *septum lucidum* and walls of lateral ventricles.

Dr Bright found the relative frequency of softening to take place as follows:

In the anterior, outer, and upper part of cerebrum in	2 cases.
posterior and middle lobes,	2
parts of brain external to, and on a level with, lateral ventricles,	1
fornix and septum lucidum,	1
corpus striatum,	1

The preceding tables show that great variety exists with regard to the localities in which ramollissement of the brain is most frequently found by different pathologists; still, however, we observe that the parts most frequently noticed to be softened are those in the immediate neighbourhood of the lateral ventricles. It is so in M. Andral's cases, and it is more especially so in those of Dr Abercrombie.

It must be remembered, however, in looking at M. Andral's cases, that by far the majority of them occurred on only one side of the brain, which at once takes away all idea of their being pseudo-morbid. In Dr Abercrombie's table, it will be observed, softening of the *septum lucidum* and fornix occurred sixteen times, and in the neighbourhood of the lateral ventricles six times more, which is twenty-two times out of 42 cases. It may be further remarked, that the generality of these softened portions are not mentioned to have been altered in colour, or any other particular remark made regarding them, further than that they were softened. The same remark applies to numberless cases which have been recorded, and in which parts of the brain have been simply described as softened, both when symptoms of disease of the brain have been present during life, and also when no such symptoms existed.

To turn to our experiments on pseudo-morbid softenings, and compare the results with those mentioned above, and taken from the works of authors on the diseases of the brain, we shall find that the softenings occur most frequently in the central parts of the brain, and chiefly in the *septum lucidum*, *fornix*, and *corpora striata*.

I do not mean to say that, in consequence of this circumstance, any one of the cases from the authors we have quoted were not genuine cases of morbid ramollissement; I only wish to point out a source from which fallacy may arise, and from which, I conscientiously believe, it has not unfrequently arisen. This latter statement will appear the more likely when we remember that, in general, no mention is made, further than that such and such parts were found in a state of softening; no mention is made of the interval between death and dissection; and that no mention is made of the season of the year at which the occurrence took place, the importance of all which are now generally known and recognized.

Softenings may be considered then the result of inflammatory action, when they are surrounded with a zone of red vessels, with small coagula, or if the softened portions are infiltrated with purulent matter,[*] and also, if taking into consideration all the circumstances mentioned above, we cannot attribute them to be connected with pseudo-morbid phenomena.[†] There is another point to which we would shortly direct attention, viz. the connection of softening of the ventricular walls, or surface of the brain, connected with morbid effusion of serum.

Large effusions of serum are found in the ventricles without any softening whatever of the walls of the ventricles, nay, even there is sometimes an unusual hardness in them. Again, with very moderate effusion of serum, we sometimes find the walls of the ventricles extremely soft, and the *septum lucidum* and *fornix* broken down. With regard to the former of these two states, when the ventricular walls are found hard, along with ventricular effusion of serum, we are inclined to look upon this hardness as the result of disease. We have not unfrequently seen cases presenting this state of matters, when a considerable interval has elapsed before dissection, and when we believe in ordinary cases, considerable softening would have taken place. And with regard to the latter, or when considerable softening is found with little effusion of serum, it may be remarked that white softening under such circumstances most generally arises from imbibition of fluid by the cerebral substance.

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[*] M. Lallemand imagines, that in every case of white ramollissement the white colour results from purulent infiltration; this, however, besides being denied by M. Andral, obviously cannot be the case, as white softening is the common result of putrefaction.

[†] It is of consequence also to remember, that many slight inflammatory softenings are rendered much more so by pseudo-morbid causes, and more especially in young persons, when the texture of the brain has less consistence than those more advanced in age.

Pseudo-morbid phenomena in the cerebral envelopes.—We have, in the last place, to consider the phenomena belonging to the above head, which the membranes of the brain are liable to present. We shall find that there is only one appearance in the arachnoid and *pia mater*, which is liable to be mistaken for actual disease of the membrane; we refer to opacity of these membranes covering the brain from effusion. It is a well known fact, that in those who die of a lingering disease, and more especially where there is much impediment to the circulation of blood through the lungs, or its return from the head by venous obstruction, there is generally a considerable effusion of serum found under the arachnoid and into the ventricles. Thus M. Louis says, that subarachnoid effusion is generally absent when death is sudden in phthisis, but very common when this disease proves fatal by prolonged agony and impeded venous circulation.*

Under such circumstances, then, it is not unusual to find considerable opacity of the arachnoid covering the brain, and occasionally so much is to be seen, that the membrane itself has all the appearance of being thickened, or having an effusion of lymph under it. This is an appearance, however, which is very deceptive, and which is as often produced by simple distension of the membrane by the subjacent fluid as by any other cause. When the membrane is greatly distended in this way, and the meshes of the *pia mater* are also filled, great opacity is the result. A similar appearance is observed in the cornea from over-distension by effusion into the interior of the eye, and which is well known to be removable by simply puncturing it, and the transparency at once returns. The same is observed also when a dead eye-ball is pressed between the fingers; the cornea becomes at once opaque, its transparency, however, immediately returning when the pressure is removed. So with the arachnoid, when effusion exists beneath it, and gives rise to opacity, we have only to make a few punctures in it, and it soon regains its transparency if arising from that cause; if not, we then conclude that the membrane itself is thickened, or that there is effusion of lymph beneath it.

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* Effusion into the subarachnoid space has been noticed in three-fourths of all cases of phthisis, and two-fifths of other diseases; the cases all opened early. (Louis.) It is well known also, that, in the fevers of this country, there is generally more or less subarachnoid effusion, accompanied, according to Dr Alison, with no other mark of inflammation. This is quite a pseudo-morbid phenomenon in our opinion, arising partly from the slow manner of death in typhoid fever, and also the interval which is allowed to elapse between death and dissection, as well as the circumstance of its being a disease where both solids and fluids are extremely prone to putrefaction.

This appearance of opacity is not unfrequently to be observed at the inferior and posterior part of the brain from the simple dependence from position of the liquor of Magendie, (cerebro-spinal fluid.)* It is easily distinguished from effusion of lymph, however, or opacity of the membrane, by the above method.

It has frequently appeared to us rather a remarkable fact, that while, in inflammation of serous sacs in general, we have the serous effusion taking place into the sac itself in the arachnoid; on the contrary, this is extremely rare; and we have been inclined to attribute this, partly to the fluid escaping when the sac is opened into, partly to gravitation towards, the base of the brain, and partly to imbibition by the subarachnoid tissue; indeed, this latter phenomenon has appeared to us of more frequent and general occurrence than any other pseudo-morbid phenomenon which the brain and its envelopes present.

ART. IX.—*Cases and Communications illustrative of subjects in Military and Naval Surgery.* By Sir GEORGE BALLINGALL, Surgeon to the Queen, Regius Professor of Military Surgery in the University, and Consulting Surgeon to the Royal Infirmary of Edinburgh.

IN the forty-seventh volume of the Edinburgh Medical and Surgical Journal, I published some cases illustrative of the reunion of parts separated by sabre wounds implicating the bones. These were accompanied with a promise that they should be followed by others, selected from the great number of interesting cases in the practice of Military and Naval Surgery of which my intercourse with, or communications from, my professional brethren have put me in possession. Various circumstances, amongst which I fear my own indolence forms one of the most prominent, have hitherto prevented me for redeeming this pledge; but I have now the pleasure to forward some cases illustrative of the very extraordinary recoveries which occasionally occur from wounds of the head and face, and the little constitutional disturbance with which they are sometimes accompanied.

With reference to wounds of the face, and to the operations which have of late years been successfully performed for the removal of tumours of the upper and under jaw, I have elsewhere observed (Outlines of Military Surgery,) that " the little constitutional disturbance which has often attended these severe and protracted operations, and the rapid and complete closure of the external wound, have surprised me more than most things which I have had occasion to witness in the practice of my profession."

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* The cerebro-spinal fluid is said to be all absorbed in twenty-four hours. This does not coincide with our observations, we having generally found it in considerable quantity at a much later period. Extravasal transudation, however, begins to take place about that time, and the subarachnoid effusion and consequent opacity is frequently earliest noticed in the immediate neighbourhood of the large venous ramifications.

This is a remark in which, I think, all those who have seen the numerous operations of this kind which have been performed in the Royal Infirmary of Edinburgh within the last twelve or fifteen years will readily concur ; and in farther illustration of the injuries which these parts occasionally sustain from external violence and the lodgement of foreign bodies, I might refer to several cases in the writings of Larrey, Hennen, Dupuytren, and others, as well as to some which have fallen under my own observation. But my more immediate object at present is to place upon record, in this Journal, three cases which, although they have been partially noticed in other publications, are not, in my opinion, so generally known as they ought to be, for the instruction and encouragement of those who may hereafter have occasion to treat such injuries. I am the more desirous of doing this, because I am enabled, through the kindness of my friends, to furnish sketches which will make these cases more readily intelligible than the verbal descriptions already given.

The cranium represented in Plate III. Fig. 1st, of which I possess an accurate cast, was for some time in my possession, having been forwarded to me by Mr Drummond of the Royal Navy, late Surgeon to Lord Auckland, the Governor-General of India. In a letter of the 14th January 1831, from which I subjoin a copious extract, Mr Drummond gives an account of the nature of the injuries sustained by this individual, and adverts to a peculiarity in the formation of the teeth which has, I believe, been subsequently more fully noticed. This case is very briefly mentioned in my " Outlines," page 262, 2d Ed. where I have observed, in support of Mr Drummond's statement, as to the cause of the numerous exfoliations, that " they are confined exclusively to those portions of the skull naturally exposed in their mode of fighting; that the lamellated or spongy bones of the nose, the alveolar processes, and other parts usually attacked by syphilitic disease, are in this instance sound."

For the memorandum of Lieutenant Fritz's case, of which I have been in possession for several years, I am indebted to Deputy-Inspector General Marshall; for the drawings to Mr Young, Surgeon of the 19th Regiment; and for an exact model or fac-simile of the breech of the gun which lay imbedded in Mr Fritz's head for seven or eight years, I am indebted to Dr Pitcairn of the 58th, who obtained it for me from my friend Colonel Frith, Commanding that regiment. All of these gentlemen have served in Ceylon, and are acquainted with many of the circumstances of this remarkable case. The breech, Plate III. Fig. 4, represented of its natural dimensions, is described as that of a fowling-piece, but seems to me, from its size and appearance, to be more like that of a soldier's musket.

The short notice of the case of Alphonse Louis, known in the Hotel des Invalides, as the "Gunner with the silver mask," is abridged from a detailed account of it given by Sir William Whymper, of the Grenadier Guards, in the 12th volume of the London Medical Gazette; and for a cast of the mutilated face, and a model of the very ingenious substitute for the lost parts, from which the drawings are taken, I am indebted to my excellent friend, Mr Nasmyth, through whose kindness I have had an opportunity of showing them to the students of Military Surgery for several years past.

I. *Extract from Mr Drummond's Letter.*—"This is the head of a well known character, chief of a considerable tribe to the northward of Sydney, and one of undaunted courage—a great warrior, or, in other words, fond of a *row*. At first sight you will be inclined to imagine, that the various inequalities are in consequence of some specific disease. This, however, is not the case, as the gentleman who gave me the head assured me that he knew almost every occasion on which the various injuries were received. Indeed, you will have no difficulty in crediting this, when I tell you that the natives of New Holland give and take such blows on the head as to a European would certainly prove fatal, causing to them only a very temporary degree of concussion.

"The extensive marks on the head are, perhaps, as much owing to exfoliation, ulceration, or absorption from neglect and filth, (no care being ever taken, or dressing applied in such cases,) as from the severity of the blow; and I am the more inclined to be of this opinion as the internal table does not appear to be injured. Their mode of fighting is with *waddies* or bludgeons of very heavy wood, giving each other alternately smart blows on the head chiefly; from which I have often seen them rendered insensible for some time, but afterwards seemed to feel no further inconvenience, although, on examining the wound, the bone has been found much injured. The same indifference is shown to a fractured extremity, unless it be a lower one, and that of a thigh, consequently no bony union is found to have taken place in such cases; and, indeed, at this period, both their sable majesties of the Sydney blacks are found to have artificial joints of the fore-arm.

"Have the goodness also to look at the formation of the teeth, which I regret, however, are not complete. You will observe that the crowns of them are flat; and I am induced to believe that this appearance is not accidental, but of original formation, having examined upwards of 200 individuals, and in none of them did I find any resemblance to our *dentes canini* or incisors. I merely mention this rather curious circumstance as deserving of further attention."

II. In the month of December 1827, or January 1828, Lieutenant Fritz, Ceylon Regiment, commanded a detachment of the corps at Fort M'Donald, which is about twenty miles south-east from Kandy. He went out one day with his fowling-piece, and he was found shortly after lying on the ground in a state of insensibility. The fowling-piece had burst, and he had received a wound in the forehead. There being no medical officer at Fort M'Donald, Mr Fritz was conveyed to Badula, which is a distance of about nineteen miles, where he was attended by Assistant Staff Surgeon Imley. The wound was situated on the brow or forehead immediately between and a little above the axis of the eyes. It was known that the frontal bone was injured; but my informant is unable to give a specific account of the nature of the injury. Mr Fritz remained at Badula a few weeks, by which time the wound in the forehead had nearly healed, and "the constitutional effects of the injury had completely disappeared." Towards the end of the year 1828, a metallic body protruded through the palate into the mouth, which body has been very gradually but sensibly advancing since that period. He has lost the sense of smelling, and a profuse discharge of puriform matter flows from the nose. In May 1835, the metallic body remained in the roof of the mouth as above described, only it has become a little more loose than formerly. None of the medical people will meddle with it. In the meantime, Jerry Fritz eats and drinks heartily, and does his duty like his neighbours. Mr Fritz never belonged to the Temperance Society, but, owing to the copious discharge from the nose, he claims the privilege of imbibing rather more freely than usual, for the alleged purpose of supporting his constitution. Owing to the offensive atmosphere which surrounds him, he has been relieved from the duty of attending at the mess of the regiment.

Extract from a Letter, dated Colombo, 3d May 1836.—" I mentioned the particulars of Captain Fritz's death in a former letter. I have since seen the iron extracted from the skull, and it is almost beyond credibility, that such a mass should have remained in the head of any man even for a day, without killing him. I believe there is much doubt as to the effect of removing it, had Captain Fritz permitted Dr Elliot to proceed."

III. Alphonse Louis, aged 22, a soldier in the French artillery, while employed in the trenches at the siege of Antwerp, in December 1832, was struck by a large splinter of a shell, which carried away a portion of the cheek, of the upper lip, the soft palate, and nearly the whole of the lower jaw, with the soft parts covering it. The tongue was entirely denuded on its lower surface, as far as the base, and, having lost its natural support, hung down to the extent of several inches over the fore part of the larynx, exposing the cavity of the throat. In addition to this, his right fore-arm, which was elevated at the moment, was also struck by the fragment of the shell, and so severely injured as to require amputation below the elbow. The symptoms of reaction which soon took place after these complicated injuries, are stated not to have developed themselves "with a degree of severity proportionate to the extent of the wounds." The patient appears to have been carefully and humanely nursed, his nutriment administered by means of a narrow curved spoon placed on the base of the tongue, and conveying the liquid food into the œsophagus. Appropriate dressings were applied to the wounds; and on the 10th of February, little more than two months after the accident, cicatrization was so far advanced, as to permit an accurate plaster cast to be taken of the face. Subsequent to this, small portions of bone exfoliated, or were removed, from a fragment of the lower jaw which remained at its articulation on the right side, leaving the face mutilated and disfigured, to an extent which will be readily understood from an inspection of the cast in my possession, or of Plate IV. Fig. 1st.

An artificial substitute for the lost part of the face was now constructed of silver, by M. Verschuylen, a skilful artist of Antwerp, from designs given by Dr Forget, who had the treatment of this interesting case. The chief objects of this contrivance were to restore the patient to a sightly appearance, agreeable to others as well as to himself,—to support the pendulous tongue,—to prevent the continued dribbling of the salivary and mucous discharges over the fore part of the neck,—to enable him to speak with facility,—and to be fed with ease. It seems to have been a most happy application of mechanical ingenuity, to relieve an individual so grievously mutilated; and how far it was successful in attaining the above-mentioned objects, will perhaps be best understood from an inspection of Plate IV. Fig. 2d; and the concluding passage of Sir William Whymper's minute detail of this case in the Medical Gazette.

"The use of the mask is by no means painful or inconvenient, considering the nature of the wound. It is, above all, of great assistance in arresting in their passage and retaining in the cavity of the artificial chin, the salivary and mucous secretions;

it facilitates the action of the tongue; it has restored a face dreadfully mutilated to a human form; it has singularly softened the rigour of the sufferer's fate, conduced to his comfort, and rendered his existence not only desirable, but comparatively happy. On our last visit to Alphonse Louis, the day previous to his departure for Lille, he appeared in high spirits; he walked about with agility; used the stump of the fore arm with address; took off and re-adjusted his mask with his left hand; spoke not only intelligibly but easily; he was high-coloured, and fatter, as he stated, than he had ever been prior to his misfortune. He played at cards, and seemed to be as proud of showing the mechanism of his artificial jaw, as he was of the crosses of the Legion of Honour and Leopold that glittered on his bosom."

Explanation of the Plates.

Plate III. Fig. 1. represents the head of the South-sea chief, described in Mr Drummond's letter.

Fig. 2. Represents the wound in the forehead of Lieutenant Fritz; and part of the foreign body is seen projecting through the palate.

Fig 3. Represents a vertical section of the head, showing the position in which the foreign body was lodged.

Fig. 4. Represents the breech of the musket of its natural dimensions.

Plate IV. Fig. 2. Represents the mask worn by Alphonse Louis, with the straps and apparatus attaching it to the head.

The chin-piece A is made to turn aside on a hinge, by touching the button or spring marked B, and thus exposes the artificial mouth. The part marked C is capable of being alternately raised and depressed by touching the spring D, and thus admitting the introduction of the aliment.

Art. X.—*Antiquarian Notices of Leprosy and Leper Hospitals in Scotland and England.* Part II. The Nosological Nature of the Disease. By James Y. Simpson, M. D., F. R. C. P., Professor of Midwifery in the University of Edinburgh. (Continued from Vol. lvi. p. 301.)

In the preceding Part we have shown the extent to which leprosy prevailed during the middle ages in Great Britain; the number of hospitals that were instituted for the reception and seclusion of the infected; the government and regulations of these hospitals; and the dates of the commencement and disappearance of the disease in the kingdoms of England and Scotland. Before proceeding further, we propose,—in this Second Part,—to pause and discuss the strictly medical question of the specific nosological nature of the malady, whose history we have thus far considered.

I have already taken occasion to speak of the Leprosy of the middle ages, as identical with the species of cutaneous disorder, which has been variously denominated the Tubercular Leprosy, (*Lepra Tuberculosa*); the Leprosy of the Arabians, (*Lepra Arabum*); and the Elephantiasis of the Greeks, (*Elephantiasis Graecorum*). The particular form of chronic cutaneous disease, to which these different appellations have been severally applied, is an affection very distinctly marked in its more leading symptoms and course. Before, however, attempting to prove that the European and British leprosy of former times was specifically identical with the malady in question, it will expedite our investigation of the question, if, in the first instance, we obtain a precise and perfect picture of the Tubercular or Arabian leprosy itself. By adopting this plan, we shall have placed before us a standard, as it were, by which we can judge of and test those more or less imperfect descriptions of the leprosy of the middle ages, which we may in the sequel have occasion to quote and animadvert upon. And, in order to obtain such a standard of comparison as we have now in view, and that without any possibility of prejudging the subject, I shall cite the description of this species of disease from Dr Bateman of London, and Dr Schedel of Paris;—from the first, because the characters which he has given of this and other cutaneous affections are generally and justly looked upon by British pathologists, as the most clear and distinct that can anywhere be referred to;—and from the last, because his account of tubercular leprosy is, I believe, the latest that has issued from the medical press, and the author has already, by a former work,* distinguished himself by the excellence of his descriptions, and the precision of his diagnosis of cutaneous diseases.

Modern Descriptions and Definitions of Tubercular Leprosy.

"The Elephantiasis," says Dr Bateman,† "(as described by the Greeks), is principally characterized by the appearance of shining tubercles, of different sizes, of a dusky red or livid colour, on the face, ears, and extremities; together with a thickened and rugous state of the skin, a diminution or total loss of its sensibility, and a falling off of all the hair, except that of the scalp.

"The disease is described as very slow in its progress, sometimes continuing for several years, without materially deranging the functions of the patient. During this continuance, however, great deformity is gradually produced. The alae of the nose become swelled and scabrous, and the nostrils dilate; the lips are tumid; the external ears, particularly the lobes, are enlarged and thickened, and beset with tubercles; the skin of the forehead and cheeks grows thick and tumid, and forms large and prominent rugæ, especially over the eyes; the hair of the eyebrows, the beard, the pubes, axillæ, &c. falls off: the voice becomes hoarse and obscure; and the sensibility of the parts affected is obtuse, or totally abolished, so that pinching or puncturing them gives no uneasiness. This disfiguration of the countenance suggested the idea of the features of a satyr or a wild beast; whence the disease was by some called *Satyriasis*, and by others, *Leontiasis.*

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* Abrégé Pratique des Maladies de la Peau, (1828.) par MM. Cazenave et Schedel.

† Practical Synopsis of Cutaneous Diseases, (edit. of 1829) 411, 412.

"As the malady proceeds, the tubercles begin to crack, and at length to ulcerate: Ulcerations also appear in the throat, and in the nose, which sometimes destroy the palate, and the cartilaginous septum; the nose falls, and the breath is intolerably offensive. The thickened and tuberculated skin of the extremities becomes divided by fissures, and ulcerates, or is corroded under dry sordid scabs, so that the fingers and toes gangrene, and separate, joint after joint."

The description of the course and symptoms of the disease, as given by Schedel, is more minute and detailed.

"*Lepra tuberculosa*, or Greek Elephantiasis, is," (he observes,*) "characterzied by the eruption of fawn-coloured or yellowish-brown tubercles, various in size, irregular in shape, somewhat shining, and soft and smooth to the touch. These tubercles are preceded by erythematous patches, in which the sensibility of the skin is diminished: slightly elevated at their outset, they become afterwards more projecting, whilst the sensibility of the parts is usually quite lost, although they are sometimes painful when touched. They more frequently occur upon the face, the nose, the ears, the lips, &c.; and being accompanied with a thickened and rugous state of the skin, they cause a most hideous distortion of the features, and frightful deformity.

"The evolution of the leprous tubercles is usually preceded by that of slight erythematous patches of a tawny red hue in whites, and blacker than the surrounding integuments in negroes. These patches are worthy of attention, since they announce the dreadful disease which is about to appear. When they are of some duration, the skin in these points already begins to lose its sensibility. Sooner or later, in some cases quickly, in others very slowly, small, soft, livid red tumours appear, varying in size from that of a pea to that of a walnut, or even larger. When these tubercles come out, the erythematous patches, on which the sensibility of the integument had become lessened, sometimes becomes painful; so much so, that we have heard patients declare that the pain produced by the handling of the small tumours at this period was similar to that felt when the cubital nerve receives a blow at the elbow. When they appear on the face, they are generally accompanied by a puffy swelling of the surrounding parts.

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* Library of Medicine, edited by Dr Tweedie. Vol. i. (London, 1840), p. 418. Among his list of Synonymes, Dr Schedel gives "The Tsarath of Moses; Lepra Hebraeorum; Lepra Egyptica; Lepra; Lardrerie," &c.

"Sometimes only small surfaces are attacked. We have seen the nose and ears alone affected, and much swollen and enlarged. When the disease occurs on the lower extremities only, it is found on the inferior part of the thigh, and around the ancles.

"After remaining stationary for a longer or shorter time, the disorder increases: instead of a few tubercles to be met with here and there, the whole face is covered with large dusky red lumps, separated by deep furrows; the features are horribly distorted; the alæ of the nose are thickened and swollen; the nostrils dilated; the eye-brows tuberculated and overhanging; the lips enormously thickened; the skin of the forehead and cheeks is thick, uneven, and tumid; the chin much increased in size, and the whole of the affected surfaces appear as if smeared with oil, and of a dusky livid red; the external ears, especially the lobes, are much enlarged and thickened, and beset with tubercles; the eyebrows and eye-lashes and beard fall off; the sense of smell becomes impaired or totally lost; that of touch is often strangely affected; the voice grows husky, and is frequently lost; the eyesight is greatly weakened; the unfortunate patient is dejected; and the muscular powers depressed in a singular manner. With regard to the *libido inexplicabilis*, so much spoken of, our observations do not coincide with those of Dr Adams, who mentions actual wasting of the generative organs. In the cases which have come under our notice, we have witnessed quite the reverse, and yet several were young men in whom the disease was not too far advanced.

"At a still later period the symptoms are even more dreadful: the tubercles become the seat of ulceration, and sores of an unhealthy character succeed, and discharge an ichorous fluid, which, on concreting, form dark adherent scabs of various extent and thickness; these incrustations are sometimes followed by cicatrices, but this is unfortunately a rare occurrence. On the extremities, the thick and tuberculated skin becomes divided by fissures, and ulcerates or is corroded under the dry scabs, so that the fingers and toes mortify and separate joint after joint, the miserable patient surviving these horrid mutilations. Those individuals whom we have seen perish from this disease were carried off by enteritis: large ulcerations were found in the ilium, cæcum, and colon, excepting in one case, in which death was caused by tubercular phthisis."

In studying the phenomena of this, as of any other disease, it will simplify our recollection of its more leading and more constant characters, if we have the principal symptoms of it embodied in a concise nosological definition, instead of being spread through a long and a detailed description. Two of our last and best British nosologists give the following definition of Tubercular leprosy or Greek elephantiasis, (for I use these terms here and elsewhere as words perfectly synonymous.)

"Elephantiasis," (says Dr Cullen,) "is a contagious disease, with, (1.) the face deformed with tubercles; (2.) the skin thick, wrinkled, rough, unctuous, and divested of hair; (3.) loss of feeling in the extreme joints, and (4.) the voice is hoarse and nasal."[*]

In defining the genus Elephantiasis, Dr Good selects the second and third characters of Cullen as the most distinctive, and adds to these two others, viz. "(1.) eyes fierce and staring; (2.) perspiration highly offensive." In defining the first species of this genus, (or the Greek elephantiasis of other authors,) he introduces as its three pathognomonic symptoms, the first and fourth characters of Cullen and a part of the second.[†]

NOMENCLATURE OF THE DISEASE.

Leprosy, such as it is pourtrayed in the descriptions and definitions which we have quoted from Bateman, Schedel, Cullen, and Good, (and I might have cited any of our modern medical writers to the same effect) has had at different times, and by different authors, a great variety of appellations applied to it. In order to understand the nosological nature of the disease, as it formerly prevailed in Europe, it is requisite to state a few uninteresting but indispensable facts, in regard to the changes which have occurred in its nomenclature.

In the medical writings of Aretæus, Aetius, and the later school of Greek physicians, the disease is described under the title of Elephantiasis, for (says Aretæus) "it is disgusting to the sight, and terrible in all respects, *(est visu fædus et in omnibus terribilis,)* like the beast of the same name."[‡] The Arabian medical authors applied the corresponding term of "*Das Fil*," "Elephant disease," or Elephantiasis, to an affection entirely different, and one apparently unknown to the Greek physicians, namely, the tumid, Barbadoes, or Cochin Leg of modern pathologists. At the same time the Arabian authorities described the disease, known to the Greeks under the name of Elephantiasis, by the Arabic terms "*Judam*," or "*Juxam*" and "*Aljuxam*."* The confusion thus apt to arise from describing two different diseases under a corresponding name, was greatly increased by the errors committed by the Latin translators of Avicenna, Rhazes, and other Arabic authors. These translators rendered the *Das fil* or Elephant disease of the Arabic original, by the words Elephanta and Elephantiasis; and having thus, first, by an improper adaptation, appropriated the use of the latter Greek term, to a disease very different in its specific characters from the Elephantiasis of the Greeks themselves, they subsequently added to the intricacies of the subject, by translating the Arabic "Juzam," (the disease that was in reality identical with the Elephantiasis of the Greeks,) by the term Lepra; a term which the Greek physicians had generally applied to different forms of scaly eruption, but never to any form of tubercular disease.†

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[*] "Morbus contagiosus, cutis crassa, rugosa, aspera, unctuosa, pilis destituta; extremis artubus anaesthesia; facies tuberibus deformis; vox rauca et nasalis." Synopsis Nosologiae Methodicae, (1772,) p. 369.

[†] Class III., Order IV., Genus VIII. *Elephantiasis*; (1.) Skin thick, livid, rugose, tuberculate; (2). Insensible to feeling; (3.) Eyes fierce and staring; (4.) perspiration highly offensive." Species I. (Tubercular or Arabian Leprosy of authors.) "(1.)Tubercles chiefly on the face and joints; (2.) Fall of the hair except from the scalp; (3.) Voice hoarse and nasal; contagious and hereditary." Good's Physiological System of Medicine, (1817,) p. 257, 258.

[‡] De Causis et Signis Morborum, p. 69. (Leipsic, edit. of 1735.)

By these unfortunate mistakes, medical men were betrayed into great confusion in the use of these several terms. An identity in names did not signify an identity in objects. The tumid leg, *das fil*, or elephantiasis of the Arabians, is a disease perfectly different from the tuberculous face affection or elephantiasis of the Greeks.

Again, the term Lepra, as used by the Greek physicians themselves, signifies morbid changes in the skin marked by the presence of scales, and which changes in the skin have no relation whatever to either the Arabian or Greek elephantiasis; but the same term lepra, as used by the Arabic translators, was applied to designate the latter of these two affections, viz. the Arabic "Juzam," or elephantiasis of the Greeks. Hence, the *Elephantiasis of the Greeks* and the *Lepra of the Arabians*, or more properly of the Arabian translators, are expressions altogether synonymous as being employed to designate the same individual disease; and it is of the first importance to hold this fact in view, in studying the histories of the European leprosy, which have been left us by our own and by other medical authors of the middle ages.[*] For we must further recollect, that the knowledge of the Greek tongue was almost entirely lost during the dark ages, and that nearly all learning being then confined to the Moors and Arabs, the scholastic language was principally the Arabic. Thus it happened, that when the love of literature and the pursuit of science began to revive about the twelfth century, the medical as well as the philosophical writings of the ancient Greeks were read and studied by the inhabitants of Western Europe, through the medium of Arabic translations of them, or in Latin versions made from these translations.[†] The designations of individual diseases were known to the learned student, and to the medical practitioner and author of the times in question, by the names only under which they were described in these versions. The *Elephantiasis* of the Greeks, or corresponding *Juzam* of the Arabians, was rendered by the term *Lepra* in almost every Latin translation from the Arabian or Saracenic school; and hence it is that we find this term Lepra used by the medical and other authors of the succeeding period, as the common appellative for the individual disease to which the two former designations were originally applied. In many medical works of the middle ages the single name "*Lepra*"[‡] is employed; in the writings of others, and more particularly of later authors, it has the distinctive designation (*Lepra Arabum*,) added to it,[§] in order to discriminate it from the *Lepra Graecorum* or scaly eruptions, to which that term was primarily applied by the Greeks. In still more modern times, and with the same view, the *Elephantiasis Graecorum*, Juzam, or Lepra of the Arabians or rather of the Arabian translators, has been very frequently termed, (as I believe was first proposed by Vidal,*) tuberculous leprosy, (*Lepra tuberculosa*,) in order to distinguish it from the other very different disease, the scaly leprosy of the Greeks, (*Lepra vulgaris*, *Lepra squamosa*, &c.) But whatever may be the difference in the nomenclature of different authors, we are to hold this in recollection, that the various terms of the Elephantiasis of the Greeks, (*Elephantiasis Graecorum*,) the Juzam or Leprosy of the Arabian translators, (*Lepra Arabum*,) the Tuberculous Leprosy of modern European authors, (*Lepra tuberculosa*, *Lepra nodosa*,) and the simple Leprosy (*Lepra*) of most authors of the middle ages† —all signify that same specific and individual disease, whose distinctive characters we have already traced from Bateman and Schedel, and from Cullen and Good.

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* The disease is still designated in different parts of Asia and Africa by the same terms, more or less slightly changed. In his travels in Africa, Egypt, and Syria, (p. 332,) Browne speaks of elephantiasis under the local designation of *dzudham*; Niebuhr says it is still named in Arabia and Persia *dsjuddam* and *Madsjuddam*. (Pinkerton's Collection of Voyages and Travels, Vol. x. p. 170.) In Morocco it is called at the present day *Jeddem* and *Murd Jeddem*.—(Jackson's Account of the Empire of Morocco.)

† The remark in the text applies to nearly all the numerous Latin versions made from the Arabic. It is proper, however, to add, that the translator of the works of Haly Abbas has so far avoided the error alluded to, by translating the Juzam of his author by Elephanta. With this single exception, the error might otherwise, I believe, be called universal.

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[*] The Arabians (*i. e.* the Latin translators from the Arabians), and their expositors, as was long ago remarked by Eustachius Rudius, and as has been often repeated since "per Lepram nil aliud intelligunt præter Elephantiasim." (De Affectibus Externarum Corporis Humani Partium, Venet. 1606, p. 24.

[†] See Bostock's History of Medicine (New York edition of 1836,) p. 43 and 47, or Chapters vi. and vii.

[‡] This appropriation of the single term "Lepra" for the designation of Greek Elephantiasis is still adhered to by some modern authors. Thus Plenck, in his celebrated Nosology of Cutaneous Diseases, denominates (after the example of the translators from the Arabic), the Barbadoes leg "Elephantiasis," and applies to the Greek Elephantiasis the simple term "Lepra." Hence he defines Lepra to be "that disease in which the skin, particularly of the face, becomes rugous and irregular *(aspera)*, and is deformed with large reddish-livid and chinked tubercles *(rimosis tuberibus)*, along with insensibility of the extremities, and the voice raucous and nasal." (Doctrina de Morbis Cutaneis, quâ hi morbi in suas Classes, Genera, et Species rediguntur (1783), p. 67. See also Schilling in his Commentio de Lepra, (1778),p. 2, &c.

[§] As in the works on Cutaneous Diseases by Turner, (Treatise of Diseases incident to the Skin,) (1736,) p. 2; and Lorry, (Tractatus de Morbis Cutaneis,) p. 376, &c. &c.

SPECIFIC CHARACTER OF THE LEPROSY WHICH PREVAILED DURING THE MIDDLE AGES.

Having premised the preceding tedious but necessary digression upon the nomenclature of leprosy, we now proceed to consider the question whether the particular form of disease that prevailed on the Continent and in Great Britain during the middle ages, and for the victims of which so many hospitals were built, and so many laws enacted, answered or not, in its nosological characters, to the *Elephantiasis Græcorum*, *Lepra Arabum*, or Arabian leprosy, such as we have found that malady depicted in the standards already referred to, and such as it is known to prevail at the present day in different localities in the new and old world, that I shall afterwards take occasion to specify. We begin our inquiry into the nature of the disease, by considering the characters of the leprosy as it was seen prevailing, almost epidemically, in the middle ages.

1. *Upon the Continent of Europe.*—To obtain a solution of this part of our problem, let us turn to the works of the medical authors of these early times, and endeavour to ascertain from them the nature of the disease which they denominated leprosy.

Various minute descriptions of leprosy (lepra) have been left us in the writings of different European physicians and surgeons of the middle ages, who had an opportunity of studying the disease in different kingdoms upon the continent during the period of its actual prevalence. Amongst others, we may especially refer to the accounts of it, written during the 13th century, by the monk Theodoric,[*] afterwards a distinguished surgeon of Bologna; by the celebrated Lanfranc, who was first a practitioner in Milan,[†] and subsequently in Paris; and by Professor Arnold Bachuone,[‡] of Barcelona, reputed in his day the greatest physician in Spain. Valescus de Taranta,[§] a physician of Montpellier; Bernhard Gordon,[||] Professor of Medicine in the same city; the famous French Surgeon, Guy de Chauliac[¶];—Vitalis de Furno[**] Cardinal of Albany; and Petrus de Argelata,[††] a practitioner of Bologna, have each left us descriptions of leprosy drawn up during the 14th century; and during the two succeeding centuries, we have more or less accurate accounts of the disease given by Professors Montagnana[‡‡] of Padua, and Matthew Ferrari de Gradi[§§] of Pavia, by Ambrose Paré,[||||] Joannes Fernelius,[¶¶] Palmarius,[***] Hildanus[†††] and various others.[‡‡‡]

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* Memoires de la Societé Royale de Medecine for 1782—3, p. 170. Alibert employs this term in his Monographie des Dermatoses, (1835,) Tome ii. p. 270.—

† "*Elephantiasis* a vulgo Medicorum *Lepra* vocata et quibusdam *Sancti Lazari morbus.*" "Elephantiasis quam vulgus male Lepram appellitat." See p. 680 and 716 of the Libri quinque Institutionum Chirurgicorum Joannis Tagaultii, in Uffenbach's Thesaurus Chirurgiae, (Francof. 1610.)

Each of the several authors just now named have described, with greater or less precision, the symptoms of the prevailing leprosy, or chronic incurable cutaneous disease for the reception and seclusion of the victims of which the numerous lazar-houses in Europe were established. The details which they all individually give of the leading characters of the malady,[§§§]

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[*] Chirurgia secundum Medicationem Hugonis de Luco (In Arte Chirurg. Scriptorum collect. Venice, 1546), p. 175.

[†] Chirurgia Magna et Parva. In the same collection of Surgical works, p. 207, 208.

[‡] Breviarium practicae a Capite ad plantam Pedis. Brev. ii. cap. 46.

[§] Philonium Pharmaceuticum et Chirurgicum de medendis corporis affectibus; Frankfort, 1599, p. 659.

[||] Lilium Medicinae inscriptum de morborum prope omnium curatione (vide Opera Medica, Lugd. 1574, p. 49 s. q. q.)

[¶] Chirurgiae Tractatus vii., (Lugd. 1572), p. 307, s. q. q.

[**] Pro conservandâ Sanitate, &c. Liber utilissimus, (Mogunt. 1531), c. 202.

[††] Chirurgiae Libri Sex. (Venet. 1533,) Lib. v. 23.

[‡‡] Selectiorum operum, in quibus Consilia, &c. continentur, (Lugd. 1525), consil. 299.

[§§] Consilia, secundum viam Avicennae, ordinata, (Lugd. 1535), Consil. 299.

[||||] Les Oeuvres d'Ambrose Paré, (Lyons 1652), p. 476, &c. or Uffenbach's Thesaurus Chirurgiae, (Frankfort 1610), p. 428, &c.

[¶¶] Joannis Fernelii Ambiani Universa Medicina, (Geneva 1680), p. 579 and 517.

[***] Julii Palmarii Constantini, Medici Parisienis, de Morbis Contagiosis Libr. Septem, (Frankfort 1601), p. 257—326.

[†††] Opera Observationum et Curationum quæ extant Omnia, (Frankfort 1646) p. 973.

[‡‡‡] See in Gesner's Collection "De Chirurgiâ Scriptores, &c," (Tiguri 1555,) a tract entitled "Examen Leprosorum."—Gregory Horst, Operum Medicorum, Tom. ii., (Norimberg 1660) p. 127. Franciscus de Porta, Medicæ Decad. cap. xxx. lib. 4, Von Forrest's Observationes Medicæ et Chirurgicæ, lib. iv. p. 103. Schenckius, Observationum Medicarum Rariorum, Libri vii., (Frankfort 1665) p. 803.

[§§§] Several of the authors quoted above divide the *species* Lepra into four modifications or varieties; the Lepra Leonina, Lepra Elephantia, Lepra Alopica, and Lepra Tyria. This division, which some of them freely allow to be founded more in theory are in their essential points altogether similar; and the symptoms which they describe it as presenting are exactly those which distinguish Greek elephantiasis. The disease is pourtrayed with brevity and precision by some of them. Others enter into a detail of its phenomena, greatly more minute than the descriptions I have quoted from Bateman and Schedel; and several give a history of the marks to be derived from the blood, urine, extremities, eyes, face, voice, &c., in a manner so very elaborate and minute, as might surprise us at the present day, did we not recollect the immense importance that depended in these times upon a just and faithful distinction of the disease, when, in a suspected case, a fellow-being might,—by the absence of the more characteristic signs—be saved, or—by their presence—be condemned, for the remainder of life, to all the horrors of a lazar-house. A few, as Guy de Chauliac, Argelata, &c. in the thirteenth and fourteenth centuries, and in still later times, Gregory Horst, Forrestus, &c. add a most minute and detailed account of the various symptoms which the physician ought to look for in examining a suspected person, and point out the exact mode in which he ought to proceed with this examination before venturing to consign a suspected person to the seclusion of a leper hospital, and thus for ever doom him to be a despised "child of St Lazarus."

In an essay such as the present, it would be out of place to attempt to show by the exact words of each of the authors to whom I have just now alluded, the truth of the proposition, that the Lepra in their writings, and consequently the Lepra of Europe in their times, was strictly identical with the Elephantiasis of the Greeks, and that the leper hospitals were specially intended for those affected with this disease. As examples, however, of the whole, I may cite the observations of two of the authors whom I have named; and I shall select for this purpose Gordon and Guy de Chauliac, principally from their two names standing higher in medical history than most of the others that I have enumerated—from their living at a time when the disease was most prevalent,—

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than in nature, seems to have been first proposed by Constantinus Africanus. (De Morborum Cognitione, chap. 17.) Like the fanciful fourfold subdivision of other diseases, it was made in correspondence with the Hippocratic and Galenic doctrine of the four humors. Theodorick, Arnald, Gilbert, and the other authors who, in accordance with the pathological creeds of the time, were led to adopt it, attribute each particular variety to the operation and predominance of a particular humor. John of Gaddesden has attempted in his Rosa Anglica, to dress up different medical doctrines in rude Latin hexameters, and amongst others, he announces the doctrine in question in the five following lines:

Sub specie tetrâ deturpat corpora LEPRA;
TIRIA prima datur, de *flegmate* quae generatur;
Turpe pilos pascens ALOPICUS, *sanguine* nascens;
Fitque LEONINA, *colera* fervente canina;
De *Mel* (*Melancholia*) fit tristis ELEFANTIA, tristior istis.

and from their descriptions of the malady itself being on the whole more than usually concise and methodic.

Bernhard Gordon was, at the commencement of the fourteenth century, one of the first, if not the first Professor of Medicine in the newly established school of Montpellier. "He has left us, (says Dr Freind,[*]) a large volume called *Lilium Medicinae* (for in that affected age everything writ in Physick, was either a Lily or a Rose) a book mightily celebrated in those times." This volume is generally stated to have been written about the year 1305[†] or 1309.[‡] From the very long chapter which is devoted in this work to the consideration of leprosy, I shall translate the account which the author gives of his threefold stages or classes of symptoms of the disease, viz. the occult, the infallible, and the last or terminating signs.

1. "The occult premonitory signs *(signa occulta in principio)* of leprosy are (he states) a reddish colour of the face, verging to duskiness; the expiration begins to be changed; the voice grows raucous, the hairs become thinned and weaker, and the perspiration and breath incline to fœtidity; the mind is melancholic with frightful dreams and nightmare; in some cases scabs, pustules, and eruptions, break out over the whole body; the disposition of the body begins to become loathsome, but still while the form and figure *(forma et figura)* are not corrupted, the patient is not to be adjudged for separation, but is to be most strictly watched *(nondum est judicandus ad separationem, sed est fortissime comminandus.)*

2. "The infallible signs (*signa infallibilia*) are enlargement of the eyebrows, with loss of their hair; rotundity of the eyes; swelling of the nostrils externally, and contraction of them within; voice nasal; colour of the face glossy (*lucidus*), verging to a darkish hue; aspect of the face terrible, with a fixed look, and with acumination and contraction of the pulps of the ears. And there are many other signs, as pustules and excrescences, atrophy of the muscles, and particularly of those between the thumb and forefinger; insensibility of the extremities; fissures and infections of the skin; the blood, when drawn and washed, containing black, earthy, rough, sandy matters, and other marks which authors prominently mention, but for me, those suffice which are to be found in the face. The above are those evident and manifest signs, which, when they do appear, the patient ought to be separated from the people, (*quibus apparentibus patiens est a populo sequestrandus*, or, in other words, secluded in a leper-house.)

3. "The signs of the last stage, and breaking-up (*naufragium*) of the disease are, corrosion and falling-in of the cartilage, forming

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[*] The History of Physick, 5th edit. 1758, Vol. ii. p. 263.

[†] Freind, p. 262.

[‡] Sprengel, Vol. ii. p. 448.

the septum of the nose; fissure and division (*scissura*) of the feet and hands; enlargement of the lips, and a disposition to glandular swelling; dyspnœa and difficulty of breathing; the voice hoarse and barking; the aspect of the face frightful, and of a dark colour; and the pulse small and imperceptible."*

After giving the above accurate description of the Leprosy, Gordon in a subsequent page,† earnestly states, "no one ought to be adjudged as a leper, unless there manifestly appear a corruption of the figure, (*corruptio figurae*, or that state which is indicated by his *signa infallibilia*). And I repeat to you this, (he adds,) as often as I have occasion to mention the *corruptio figurae*, because, as it appears to me, lepers are at the present day very injudiciously adjudged. Whoever, therefore, has ears, let him attend to this, if he will."

The other medical author, whom I particularized for quotation, Guy de Chauliac, practised first at Lyons, and afterwards at Avignon. He was one of the most celebrated surgeons in the fourteenth century,‡ and was successively medical attendant upon Popes Clement VI. and Urban V.§ From the notice which he gives of the Black Death Pestilence of 1363, it would seem that he was then stationed at Avignon, and engaged in the composition of his "Inventarium sive Collectorium Partis Chirurgicalis Medicinae." In the long disquisition on Lepra, contained in the 6th treatise of this work,‖ De Chauliac, after stating the usual subdivision of the disease into four varieties or species, (Elephantia, Leonina, Tyria, Alopecia,) goes on to describe the common signs of all the varieties of leprosy, (signa communia *Omnium* specierum Lepræ). The signs or symptoms indicating the actual presence of the disease are, he says, some unequivocal, others equivocal, (*quædam univoca, quædam equivoca*). Among the former set (*signa univoca*) he ranges the six following symptoms: "(1.) rotundity of the ears and eyes; (2.) thickening and tuberosity of the eyebrows, with falling off of their hair; (3.) dilatation and disfiguration of the nostrils externally, with stricture of them within, and fœtidity of the lips; (4.) voice raucous and nasal; (5.) fœtidity of the breath, and of the whole person: (6.) fixed and horrible satyr-like aspect."

I question if any of our modern nosologists, or any recent writers on cutaneous diseases, have proposed a more correct definition or accurate and concise diagnosis of the *Elephantiasis Graecorum* than is presented in the above enumeration of its pathognomic symptoms by the old French surgeon.

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* Bernhardi Gordonii Opera Medica, Lugd. 1542, p. 48 and 49.

† Ib. p. 54.

‡ See Freind, Sprengel, Eloy, &c.

§ In the Biographie Universelle, ancienne et moderne, Paris, 1813, Tom. viii. p. 293, a third Pope, Innocent VI. is added to this list.

‖ Chirurgiae Libri Septem, Lugd. 1572, p. 307, sqq.

De Chauliac adds a list of sixteen signs of leprosy, which, from their not being constant, he terms equivocal (*equivoca*). Among these, he gives tuberosity and hardness of the flesh, particularly of the joints and extremities; insensibility and feeling of torpor in the limbs; falling off of the hairs; tubercles (*grana*) under the tongue and palpebrae, and behind the ears; an unctuous condition of the skin, as seen when water is thrown upon it; with symptoms from the blood, urine, &c. "By these unequivocal and equivocal signs, lepers (says he) are examined; but (he judiciously goes on to observe), in the examination and judgment of lepers, there must be much circumspection, because the injury is very great, whether we thus submit to confinement, those that ought not to be confined, or allow lepers (*leprosos*) to mix with the people, seeing the disease is contagious and infectious. Therefore, ought the physician repeatedly to examine the affected, and consider and reconsider those signs which are unequivocal, and those that are equivocal, and let him not venture to judge by one sign, but by a concourse of many, and particularly of those that are unequivocal."

De Chauliac subsequently details at great length the precise mode in which the physician ought to conduct the examination of every suspected case of leprosy referred to him. The patient is, first of all, as we shall afterwards see, recommended to be consoled upon his unfortunate lot, and sworn in to tell the truth in answer to all the interrogatories put to him. In immediately afterwards proceeding to the examination itself, De Chauliac orders inquiries to be instituted into the predisposition, hereditary or otherwise, of the suspected individual; if he were exposed by intercourse with the infected; if his mind were clear and tranquil; if he feels punctures in the flesh, &c. He then recommends the pulse to be examined, and some blood drawn, and treated in such a manner by inspection and straining, as to ascertain its colour, its sediment, the quality of its coagulum, &c. After this he recommends the countenance to be considered, and the patient dismissed for the day, with an order to bring a specimen of his urine with him on the following morning. "In the meantime," he adds, "let the physician cogitate upon what he has seen, and what he may yet see in the case."

"On the morrow, when the suspected person returns to the physician, let the latter, in the first place, examine the urine, and consider if it shows any sign of disposition towards leprosy. All this being done, let him next again consider the face, and ascertain in regard to the eyebrows if they have lost their hair, and if they are swollen and tuberose; if the eyes themselves are round, particularly towards the internal angles, and if the whites of them are of a darkish hue; in regard to the nose, if it be deformed, enlarged, and internally ulcerated; in regard to the eyes, if they are rounded and shortened; in regard to the voice, if it is raucous and nasal; in regard to the lips and tongue, if they are ulcerated and tuberculated; if the breathing be difficult and fœtid; and if the features be changed and frightful. And let the examiner consider these things deeply, because the signs from the face are more certain than the others. Afterwards make the person strip himself naked, (*ipsum expoliare*), and examine concerning the colour of the whole body, if it is darkish and morphous; concerning the substance of the flesh, if it is hard and irregular, and tuberose, particularly about the joints and extremities; if it is scabrous, pruriginous, or serpiginous and ulcerous; if its corion is rough, like the skin of the goose; and if the muscles are consumed; if there is a feeling of sleeping in the limbs; if he feels perfectly when pricked along the back of the leg, and is certain in respect to the spot and kind of instrument. Then pour water upon his body, and see if it is unctuous, and if salt adheres to it, when it is thrown upon its surface. Lastly, let the physician return again to the consideration of the face and countenance, and with that dismiss the person.

"Let all the ascertained signs (cautiously, adds our author), be pondered over, and let the physician deliberate naturally concerning these signs, both individually and in concourse. If he should find that the suspected person has, along with a disposition to leprosy, some of the slighter equivocal signs of the disease, the individual is to be watched at his own house, and secretly, that he may be placed upon a good regimen, and have the advice of medical men, otherwise he will truly become leprous. If, however, he presents many equivocal with a few of the unequivocal signs, he is vulgarly termed *cassatus* (marked, denounced); and such individuals must be narrowly watched, in order that they take a proper regimen, and have the good advice of physicians; and in order that they confine themselves within their own houses and mansions. Let them not freely mix with the people, because they are sinking into leprosy. If, again, they are found with many, both of the unequivocal and equivocal signs, they must be separated with kind and consoling words, from the people, and committed to the leper hospitals (*in Malanteria ducendi*). But if they are sound, they must be set free, (*absolvendi*), and sent with a medical certificate to the Rector."

It would, I believe, be considered altogether a work of supererogation to append to the preceding details by Gordon and Guy de Chauliac, any formal remarks in the way of comparing the

Lepra of the fourteenth century with the *Elephantiasis Græcorum* of Bateman, Schedel, or any of our modern standards, and thus insisting further upon the perfect and entire identity of the individual disease passing under these two different designations. The accounts given of the malady by the two ancient and the two modern writers just named, undoubtedly agree as exactly as we ever find the accounts of one and the same disease by four different authors to do; and, as I have already said, the same remark might be extended to the relative early descriptions of the lepra, as left by numerous other authors in these times, and the recent descriptions of the *Elephantiasis Græcorum*, as drawn up from personal observation in different parts of the world by Kinnis, Ainslie, Heineken, Casan, Cazenave, and the other modern writers, that I shall afterwards have occasion to refer to when speaking of the present geographical *habitats* of the disease.

But indeed the intrinsic evidence which is afforded by the extracts that I have given from Gordon and De Chauliac, and by the other similar descriptions to which I have referred in the works of the medical authors of the thirteenth and fourteenth centuries, renders it unnecessary to add here any further comment to prove the double proposition, *first*, that the leprosy of the middle ages, as the disease prevailed upon the continent of Europe, was identical with the *Elephantiasis Graecorum*; and *secondly*, that it was for the victims of this specific malady that the numerous leper hospitals were established, they alone being the individuals who were intended to be (in the language of Gordon and De Chauliac) adjudged, separated from the people, and consigned to the lazar-houses ("*judicati*"—"*a populo sequestrandi*" "*in Malanteria ducendi.*")

So far with regard to leprosy, as seen and described by the early continental authors. Let us now return to the nature of the disease as it prevailed in Great Britain.

2. *Nature of the Leprosy in England.*—Reasoning analogically, it may certainly, with the greatest probability, be presumed, that the incurable disease which is known in the lazar-house charters and older histories of this country, under the same name as on the continent,—which prevailed here during the same periods as on the continent,—and for which the same systems of medical seclusion and police were adopted,—was entirely the same disease as that described by and known to the continental medical authors of the middle ages.

To some minds, such considerations may in themselves be sufficient to fix the identity of the disease, as it prevailed on the continent, and as it prevailed in our own country; and certainly they tend very strongly to show that if, as I have attempted to prove, the epidemic leprosy of continental Europe was the Tubercular or Arabian leprosy, the leprosy of England and Scotland was of the same specific nature. But I believe I can adduce still more direct and satisfactory evidence to establish this important point.

The first valuable medical work by an English author that has been transmitted to us is the Compendium Medicinae of Gilbert.* This author is generally supposed to have lived about 1270, in the reign of Henry III. or Edward I.† Bale places him even much earlier.‡

Gilbert has a chapter headed "De Lepra." In this chapter he describes very minutely the four usual modifications of Lepra, (the Elephantia, Leonina, Tyria, and Alopecia,) varieties which, he himself observes, are rarely found pure and simple, but generally mixed together (*compositas*).§ To quote in proof of this his long and very detailed account of the disease would occupy much space and only lead to repetition. That the description, however, which Gilbert has drawn of the leprosy of the middle ages is one of the most just and accurate penned during these times, has been often and freely admitted by Sauvages, Sprengel, and other competent judges. Further, that the Lepra as described by Gilbert, and as understood by him and his contemporaries in England, meant the Elephantiasis of the Greeks, is evident (without going into particulars) from the simple fact, that the sagacious Sauvages refers and quotes this chapter of Gilbert's on Lepra as one of the best descriptions extant of Greek Elephantiasis.‖

In an official report given in to the Royal Society of Medicine of Paris in 1782, upon the Greek Elephantiasis, the reporters, MM. Chamseru, and Coquereau, specially allude to Gilbert's description as the most clear exposition of it to which they could refer.¶ Again, in an analysis of the works of this early English author, the learned Professor Sprengel observes, "Gilbert sometimes relates, though very rarely, observations which are proper to himself, and which deserve to be quoted. In this number I include particularly those concerning leprosy. We may almost look upon them as the first exact description which has been given of that malady by the Christian physicians of the west. The spots which foretell it, and the signs of its first invasion, are at least described by him in a manner agreeable to nature, &c."*

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* Gilberti Anglici Compendium Medicinae, tam morborum universalium quam particularium, non solum medicis sed et chyrurgicis utilissimum. Vienna, 1510.

† Eloy's Dictionnaire Historique de Medecine Ancienne et Moderne, 1778, Tome ii. p. 349. Aitkin's Biographical Memoirs of Medicine in Great Britain, 1780, p. ix.

‡ Freind's History of Medicine, 5th edition, Vol. ii. p. 268.

§ Compendium Medicinae (ut supra) p. 340.

‖ Nosologia Methodica, Tome v. p. 229. Before citing Gilbert's description, Sauvages observes, "Plures hujus morbi (Elephantiasis,) varietates sunt quarum nomina et signa ex Gilberto Anglo mutuabimur, loco Leprae Elephantiasin nominando."

¶ Memoires de Medecine et de Physique Medicale tirés des Registres de la Societé Royale de Medecine, Années 1782–83, p. 200. Speaking of the Greek Elephantiasis or Elephantiasis Legitima of Sauvages, they observe "on ne trouvoit nulle part. pas même dans Arétée de Cappadoce, une exposition plus claire que celle qui a été donnée par Gilbert, Medecin Anglois du seizieme (?) siecle."

Here then, we have the direct and positive evidence of an English physician of the thirteenth century, that the term Lepra was then used in this country specially to designate the varieties of Greek elephantiasis; and I might adduce, (if it were at all necessary,) to demonstrate exactly the same circumstance, the chapter which John of Gaddesden, Professor of Medicine in Merton College, Oxford,† and Court physician to Edward II., has devoted to Lepra or Elephantiasis in his famous Rosa Anglica, a work written towards the commencement of the succeeding or fourteenth century.‡ In this "Opus luculentum et eruditum," (as at least Leland terms it,)§ the author describes at considerable length the nature, causes, and premonitory signs, &c. of lepra and its varieties, and enters minutely into the pathognomonic signs (signa demonstrativa infallibilia) of the disease, as respectively taken from the face, from the extremities, from the blood, and from the humors of the body. A quotation from his signs of Leprosy, as taken from the face, will at once show that by that term (Lepra) he meant the Greek Elephantiasis. I shall give the passage in his own words. "A *Facie*, rotundatio oculorum, contractio palpebrarum, lacrimositas multa et aquositas oculorum, depiliatio superciliorum et grossities eorum; dilatatio narium exterius et constrictio interius, et coartatio anhelitus, quasi si cum naribus loqueretur. Et color faciei lividus vergens ad fuscedinem mortificatam. Terribilis aspectus faciei cum fixo intuitu. Contractio et palpebrarum et aurium. Infectio cutis maculosa. Tuberositas et pustulae in facie et nodositas. Ista omnia et major pars sunt infallibilia signa lepræ actualis."|| In a subsequent part of his chapter on Lepra, John of Gaddesden strongly states, that "no one is to be adjudged a leper, and separated from intercourse of mankind, (*ab hominum conversatione separandus*) until the figure and form of the face is actually changed. Hence cancer (gangrene?) in the feet, or foul scabbing, must not be considered as arguing the pre-

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[*] Sprengel's Histoire de la Medecine, (Jourdain's translation.) Tome ii. p. 404.

[†] Anthony Wood's Athenae Oxonienses, p. 87.

[‡] Wood gives his name as entered in an old College Catalogue in 1320. He compiled his book between 1305 and 1317, Freind, Vol. ii. p. 277; and Eloy, Vol. ii. p. 287. See also Hutchison's Biographia Medica, Vol. i. p. 323; and Aitkin's Biographical Memoirs, p. ix., &c.

[§] Guy de Chauliac entitles Gaddesden's book (probably with more truth) "una *fatua* Rosa Anglica."

[||] Rosa Anglica quatuor Libris distincta, (Papiae, 1492.) Lib. ii. cap. vii. p. 55; or Joannis Anglici Praxis Medica, Rosa Anglica dicta (Schopffin's edit. 1595,) p. 1076, sqq.

sence of leprosy, nor nodosities, unless they appear on the face and with the aforesaid conditions."*

The testimony of Bartholomey Glanville, an English author of the latter part of the fourteenth century,† may be adduced in support of the same view. In his work "De Proprietatibus Rerum" he describes persons affected with Leprosy (Lepra) as having "redde Whelkes and Pymples in the Face, out of whome oftenne runne Blood and Matter: in such the Noses swellen, and ben (become) grete, the vertue of Smellynge faylyth, and the Brethe stynkyth ryght fowle." When, he further observes, the disease is so advanced that the infected are "unclene, spotyd, glemy, and quyttery (ichorous,) the Nosethrilles ben stopyl, the Wasen of the Voys is rough, and the Voys is horse, and the Heere [hair] falls."‡

In addition to the preceding direct medical evidence, it may not be considered irrelevant to the present question, to remark that, in most of the lazar-house charters and notices in England and Scotland that I have had access to, the inmates of these institutions are described by the adjective *Leprosus*, or by some application of the corresponding noun *Lepra*, as "lepra percussi," "infecti lepra." I have, however, met with one very striking exception to this general rule, and I allude to it here as confirmatory of what I have stated, with regard to the nature of the disease for which these leper hospitals were instituted in our own country. The leper hospital of Shireburn was, as I have already had occasion to mention, endowed for sixty patients, and was hence one of the largest in England. It was founded in 1181 by Hugh Pudsey, "the jollie Bishope of Durham." In a MS. History of the Durham Cathedral and Diocese, contained in the Bodleian Library,§ the inmates of the Shireburn Hospital, instead of being termed *Leprosi*, are directly designated *Elephantuosi*. In speaking of the acts of Bishop Pudsey, the MS. states, amongst other things, that he constructed the hospital of Shireburne, and planted in it lepers collected from all parts of the bisophrick. (*Elefantuosos*, in Epispocatu suo circumquaque collectos, ibidem instituit.)

Nature of the Leprosy of Scotland.

I have hitherto said nothing to show that the disease in Scotland was of the nature of Greek elephantiasis. During the earlier ages at which it prevailed in this country, medicine was little cultivated, and we have no professional work of any kind left us by the Scottish physicians of that period, from which to derive any evidence on this subject.*

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* Rosa Anglica, p. 1079. The editor, Schopffen, appends to this passage a rubric, stating the above sound counsel, as "Decretum Joannis Angli de Leprosis."

† Pitt places him about 1360, Eloy, Vol. ii. p. 354; Freind, Vol. ii. p. 293.

‡ From the old translation of Glanville's work, "De Proprietatibus Rerum," by John Trevisa, vicar of Barkley. See Phil. Trans. Vol. xxxi. p. 59.

§ Eccles. Dunelm. Hist. l. liii. f. 56, a; vide Monasticon Anglicanum, Tom. ii. p. 437, a.

Amidst this dearth, however, of medical writings during the middle ages in Scotland, it gives me pleasure to refer to a passage in one of our earliest Scotch poets, affording proof that the Leprosy of this country was, as on the continent, truly the Greek elephantiasis.

It is well known to the lovers of early Scotch literature that Henryson, a schoolmaster of Dunfermline, who wrote before the year 1500, composed, among other things, the Testament of Cresseid as a sequel to the Troilus and Cresseid of his immediate predecessor Chaucer.† Indulging, like his English prototype, in the wildest forms of anachronism, the Scottish poet confessedly subjects, in almost every particular, the ancient and foreign characters of the piece to the manners, incidents, and institutions of his own times, and of his own country In this spirit he afflicts, at last, the fickle and unfortunate Cresseid, with leprosy, as perhaps the most appalling of dooms to which he could consign her. The poet, afterwards, sends her "unto yone hospitall at the tounis' end." The particular symptoms which he makes Saturn invoke upon Cresseid, to transform her into a Leper, are exactly the most marked symptoms of Greek elephantiasis.

> Thy cristall ene (eyes) minglit with blude I mak‡,
> Thy voice sa cleir unpleasand, hoir, and hace,
> Thy lustie lyre (fair skin) ouirspread with spottis blak,
> And lumpis haw (livid*) appeirand in thy face;
> Quhair thow cummis, ilk (each) man sall fle the place;
> Thus sall thow go begging fra hous to hous,
> With cop and clapper like ane Lazarous.

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* Bernhard Gordon of Montpellier, whose description of the disease I have already quoted, has been sometimes alleged to be a native of Scotland, see Sprengel's Histoire, ii. p. 447; but without any other evidence whatever than that derivable from his Scottish surname.

† The Testament of Cresseid, compylit be M. Robert Henrysone, Sculemaister in Dunfermeling. Imprentit at Edinburgh, 1593. Reprinted by the Bannatyne Club, Edinburgh, 1824. The poem has been published, without the name of the author, in Godfray's and most other later editions of Chaucer's Works.

‡ This complication was not so common as to be regarded as a constant and pathognomonic sign of Greek elephantiasis, but it is noted as an important and frequent one, by various authors, both ancient and modern. Hally-Abbas tells us in our diagnosis of a case of the disease, to be particular in examining "album oculorum ne forte turbatum est," (Lib. i. cap. xxiv.); Rhazes attributes great value as a diagnostic mark of his Juddam or elephantiasis to the "conturbatio albedinis oculorum," (Lib. v. cap. cxx.); Avicenna, among his incipient signs, states "et apparet in oculis obfuscatio ad rubedinem declivis," (Lib. iv. Fen. iii. Fr. 3, cap. ii.) Not to multiply examples, I may merely mention that Theodoric, in the thirteenth century, places early among his list of signs "oculorum in albedine lividitas" (Lib. iii. cap.

In this remarkable passage, those more striking symptoms, the swellings, lumps, or livid tubercles on the face, the morbid alteration of the voice and skin, and that turgid and injected appearance of the eye, which Dr Good has given as one of his characteristic symptoms of the *genus* Elephantiasis, are all tersely, yet accurately described. Indeed, if Sauvages, Swediaur, Cullen, or any of our great nosologists of the last or present century, had been poets, I greatly doubt whether, with all their medical knowledge to boot, they could, in four fettered lines of rhyme, have described the Greek elephantiasis more faithfully and briefly than we have it described in the four first lines that I have just quoted from the Dunfermline schoolmaster of the fifteenth century. Henryson's account of a leper may not be so poetically beautiful, but it is pathologically much more true than that which the American poet, Willis, has recently given of the disease in his well-known poem of Helon. We shall afterwards find that " the cop and clapper," alluded to in Henryson's two last lines, were badges commonly carried by the inmates of the leper hospitals of Scotland.

In passages subsequent to that which I have quoted, Henryson reiterates some of the more prominent symptoms. Thus, the hapless Cresseid afterwards describes what is elsewhere termed " her uglye lipper face, the whilk before was quhite (white) as lilie flour," as " deformed in the figour;" and again also she describes and laments the characteristic morbid change in the voice;

> My cleir voice and my courtlie carrolling
> Is rawk (rank) as roke, full hideous, hoir, and hace."

But I have still further and stronger proof to adduce that the Leprosy of the Scotch was the Tubercular Lepra or Greek elephantiasis. It has been already stated that the disease continued to prevail in the Shetlands, apparently long after it had left all the more southern parts of the British Islands. We have found

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lv.); see also Lanfranc, (Doct. i. Tr. iii c. 7, albedo oculorum obfuscator); Arnald of Villeneuve (Brev. ii. c. 46, multum rubeae); Gilbert (Lib. viii. oculi circulos habent rubros), &c. Dr Heberden, in his account of the tubercular leprosy in Madeira, states, in regard to a case, " that the confirmed elephantiasis was attended with *livid* and scirrhous tubercles, which had overspread the face and limbs; the whole body was emaciated, the eyebrows inflated; the hair of the eyebrows fallen off entirely; the bones of the nose depressed; the *alae nasi* tumefied, as likewise the lobes of the ears, *with a suffusion in both eyes*, which had almost deprived the patient of sight, &c. Medical Transactions of the College of Physicians, Vol. i. p. 35.

[*] I give the term " livid" as synonymous with the old Scotch term " haw,'' under the idea that it expresses in all probability, as nearly as possible, the meaning of the author. The Scottish writer Gawin Douglas renders the Latin adjectives " caeruleus" and " glaucus,' by the adjective " haw," in his celebrated translation of " The xiii. bukes of Eneados of the famose poet, Virgill, out of Latyne verses, into Scottish meter." For the occasional livid colour of the lumps or tubercles in the face, see the extract in the preceding note from Dr Heberden, and the modern decriptions quoted in a previous page from Bateman and Schedel.

Brand stating in 1700,* the disease to be "discovered (I quote his own words) by hairs falling from the eyebrows, the nose falling in, &c." I have shown also that in some districts of Shetland, the disease continued to a later date, and that down to 1742, the infected were kept in the island of Papa, or, as it is sometimes written, Papastour. Through Mr Charles Duncan, who has kindly exerted himself in Shetland to procure me information on the present subject, I have been favoured with the sight of an old, but important document, relative to the lepers of Papa, and the symptoms under which they laboured. The document in question was, as Mr Duncan informs me, drawn up for Sir John Pringle, by the Rev. Andrew Fisken, minister of Delting, Walls, and Sandness. The old copy I refer to, belongs to the Rev. James Barclay, (son of the late Dr Barclay of Lerwick), and I publish its contents with his permission. The minute description which it gives of the symptoms in the Lepers of Shetland can leave no doubt as to the disease under which they suffered, being the true Tubercular leprosy or *Elephantiasis Graecorum*, and the value of the evidence which it affords on this point, is only increased by the fact, that the writer did not himself belong to the medical profession. The importance of the document must plead as an excuse for its length. The copy which is quoted below is marked on the back in an old handwriting, "Case of the Lepers in Papa, as drawn up by Mr Andrew Fisken, about the year 1736 or 1737." It proceeds as follows:

"There are in the island of Papastoror in Zetland, five women who labour under a disease that, generally in this place, gets the name of Leprosie, though others alledge it deserves rather to be called a scurvy. The disease has the following appearances, viz.

"The persons affected at first find an unusual itching in their skin, with small, knotty, hard lumps to be felt under the cuticle; their whole body appears plumper than ordinary, and their eyes are observed to be clearer coloured, with a look more piercing than formerly. Their face and legs are full of small lumps or hard tumours, which in a little suppurate and throw out a black, thin, ichorous matter, and gradually encrease, especially in the face, till they turn confluent. It is also observed that where these lumps do not appear, the skin feels hard and callous, like a piece un-wrought leather, and the cuticle smoother than ordinary, and unctuous or greasy, which appears from pouring water into the palms of their hands, where it will separate into small globules, such as appear when water is poured out of a greasy vessel. The extraordinary plumpness, or rather swelling of the body, observed in the beginning of this disease, does, in a few months, disappear, and they turn very lean and weak, only their face always, and sometimes also their legs, continue swelled. A great many little lumps like small hard seeds are then to be felt everywhere under their skin, which gradually increase till they break out externally, throwing out a fœtid thin ichor, which ceases to run in a little time, and a hard scab covers the part, which sometimes dries, and, falling off, leaves the skin entire; at other times breaks out again, and runs as before. The hair falls off from their eye-brows, and they have their throats much inflamed, especially the uvula, which is gradually (and after some years continuing under the disease) entirely destroyed. Their voice is so weakened that they cannot speak louder than one whispering. They have frequent flushes of heat in their skin, which is succeeded by an universal chilliness, and they are not at that instant able to suffer the cold air without a very acute soreness in their skin. As the disease encreases, it appears still the more frightful and loathsome; their face, full of large and deep ulcers, resembles somewhat a lump of rotten cork; their gums and teeth are quite rotten, and in the night-time they are much troubled with deep-seated pains in their bodies, and have in the day-time frequent stitches and pains in all parts of their body, with a general weight and inactivity of their limbs. The women also cease to have their menstrua upon their being seized with this distemper. Their appetite and digestion is as good as ordinary; their stools regular; nothing extraordinary to be observed in their urine. They sleep pretty well, but seldom or never sweat any.

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* Since writing the above, I have met with the following interesting notice in the still earlier voyage of Martin to St Kilda, the most westerly island of the Hebrides. Describing his visit to St Kilda, in 1697, he states, "Some thirteen years ago, the Leprosy broke amongst the inhabitants, and some of their numbers died of it. There are two families at present labouring under the disease. The symptoms of it are, their feet begin to fail; their appetite declining; their faces becoming too red, and breaking out in pimples; a hoarseness, and their hair falling off from their heads; the crown (?) of it exulcerates and blisters; and, lastly, their beards grow thinner than ordinary."—Voyage to St Kilda, (first published in 1698,) p. 40 of edition of 1749.

"This disease is found by experiment to be very infectious, and seems also to run in blood, most people that have taken it without infection from another having been related to three families in the isle. It affects any age or sex, and it is observed that young persons bear it longer than those of a more advanced age, some having lived ten years under it, others only two, some four, some six, &c., but none ever recover after the symptoms above-written do appear. The persons that fall into this direful case are, as soon as it is observed, obliged to retire to a solitary little hut, built on purpose for them, at a distance from all houses, and are not allowed any converse with their husbands, wives, or nearest relations, but have their necessaries of life furnished them by a contribution from all the inhabitants of the isle, and brought to their hut, which they take in when the person who brought it has retired to the windward of their house at some distance.

"There has never been any cure of this disease attempted here, save that a few years ago a young woman in a neighbouring parish had some bolusses of mercury given her in order to a salivation; but some dangerous symptoms appearing, the administrator thought fit to proceed no further, and the patient continues still alive in the same case she was before taking the mercury."

In the voluminous MS. Medical Notes, bequeathed by Sir John Pringle to the College of Physicians of Edinburgh,* I find a copy of the above account of the Papa Lepers. Sir Andrew Mitchell of Westshore seems to have transmitted the account to him without giving any notice of the writer of it. It is entered in Sir John's notes, under the date of 1759; but it was without doubt drawn up many years previously. I have already alluded to an entry in the Session Records of Walls, regarding the disappearance of leprosy from that parish and district in 1742. The entry seems to have been made at a sitting of the session "at Northhouse in Papastour;" and its expressions † show that, at the date of it, (17th March 1742), there were no lepers in Papa. From the MS. extracts furnished to me by Mr Rannie, session-clerk, it appears that there is only mentioned of one other instance afterwards in the session books of the parish, viz. in December 1772 and 1776. The female who was the subject of it, and whose case is represented in the records as "singularly clamant," was ordered to be provided at the expense of the session, "with back and bed clothes, a house fit for her to lodge in, and maintenance to be brought to her daily at the house." Mr Rannie further states, "I have been informed by old persons, that she lived but a short time after she was put into the house built for her in the common, at a distance from other houses." He adds, "It has been reported to me that in Papa, about the year 1778, a leprous woman was put out and died in the fields before a house could be built; and that about the same time, there were leprous persons in the district of Watness, and that the son and daughter of a man Henry Sinclair were infected and sent to the hospital at Edinburgh."

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* MS. Medical Annotations, Vol. iii. p. 226.

† "The Moderator proposed to the session, that, considering that a Gracious Providence had not only delivered the Island and country from the burden and necessity of maintaining and otherwise providing for the poor Lepers, formerly in this Island, but had also put a stop to the spreading of that unclean and infectious disease, so that there is no appearance of the symptoms thereof in any person now in this place, the Session should therefore ordain a day to be set apart for solemn thanksgiving for so great a deliverance throughout this ministry excepting Fowla, which we can have no access to probably to inform. The Session having heard the Moderator's proposal were cordially satisfied therewith, and did agree unanimously that a day be set apart for solemn thanksgiving on the above account throughout the bounds of the ministry excepting Fowla, as above said." Extracts from the MS. Session Register of Walls, under date of 17th March 1742. The 19th May 1742 was held as the day of thanksgiving, as appears from a subsequent entry.

At a still later date, a case of Shetland leprosy was detected in the Edinburgh Infirmary. In 1798, a male patient from Shetland was for some time in the hospital wards, under the care of various physicians. As the form of disease under which he laboured was considered as very anomalous, Dr Thomson was requested by Dr Hamilton to visit the patient, and detected the case to be one of Greek Elephantiasis. I am kindly permitted to extract the following notes of the case from Dr Thomson's manuscripts:—

"His face was studded all over with small subcutaneous tubercles. The skin over these tubercles was of a reddish colour, intermixed with blotches, like those which occur in the *pityriasis versicolor*. The hair of the eyebrows and eyelids had fallen off, and the skin of the face, as well as of most of the rest of the body, seemed as if smeared with oil. His voice was weak and hoarse, so that he seemed to speak as in a whisper. On inspecting the fauces, they appeared in some places raw and excoriated, and in others rough and puckered. A slight ulceration was perceptible on the *septum narium*, and the nose seemed a little depressed. In various parts of the body, particularly on the arms, thighs, and legs, besides the small subcutaneous tubercles, other larger ones were to be perceived by feeling for them. These larger bumps or tubercles, which were not perceptible to the eye, and which did not occasion any discoloration of the skin, were without pain, and had a striking resemblance to the tubercles occurring in the flesh of those affected with scurvy."

The patient, John Berns, was 28 years of age. On making inquiry, it was found (as I am informed by Dr Thomson) that some of his ancestors had been affected with the same disease.

An accurate drawing of the morbid appearances presented by Berns' face was made at the time by Mr Syme, now Professor of Drawing in the Dollar Academy.* A copy of this drawing, with a history of the patient's ailments, were forwarded to the late Dr Willan; and I have Dr Thomson's authority for stating, that Dr Willan at once declared it also as his opinion, that Berns' case was a genuine instance of the Tuberculous Leprosy or *Elephantiasis Græcorum;* a disease of which, as he informed Dr Thomson, he had only seen one example in a patient shown him by Dr Baillie.

Let us for a moment recapitulate the preceding evidence, with regard to the nosological nature of the English and Scottish Leprosy:—*First*, various authors who personally witnessed the leprosy of the middle ages upon the Continent of Europe, in describing it, have described a disease having all the most characteristic symptoms of Greek elephantiasis. *Secondly*, in England a cutaneous disease prevailed at the same period, bearing the same name,—presenting the same chronic incurable character,—having its victims subjected to the same civil laws and restrictions,—marked (as we know from Gilbert, Gaddesden, and Glanville's observations and writings), by the same train of nosological symptoms—and hence identical in nature with the Continental disease, and with the elephantiasis of the Greeks. *Thirdly*, in Scotland we find a malady having the same similarity in its general date,—in its name,—in its course,—and, in the civil regulations enforced regarding it,—with its symptoms as they are accidentally described by Henryson in the sixteenth century, identical with those of Greek elephantiasis. *Fourthly*, in a part of the country where the disease has continued to prevail down to a later period, the infected, as described by eye-witnesses in the earlier part of the last century, presented the most unequivocal signs of the affection alluded to. And, *lastly*, we have as high medical evidence as could be adduced in regard to cutaneous affections (the evidence, namely, of Drs Willan and Thomson) for asserting that the malady was seen in the members of a Shetland family in which it had been hereditarily transmitted,—and, hence, in one of the last, if not the very last Scotch leper, was decidedly marked by the true and genuine characteristics of the *Elephantiasis Græcorum*.

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* Plate V. Fig. 1, presents a sketch of Berns' case, from a drawing by Mr Syme, in Dr Thomson's possession.

LEPROSY IN THE NORTHERN COUNTRIES LYING NEAREST TO SHETLAND.

On a former occasion I alluded to the existence of true Tubercular leprosy in the neighbouring Faroe Isles, in Iceland, and the nearest coast of Norway, as corroborative of the disease which has long existed in the Shetlands, being of the same nosological nature. I might now, if additional proof were necessary, reverse the order of the evidence which I have just brought forward, and proceed to show at length that the disease which long existed, and still does remain in Bergen and Iceland, and for which leper hospitals also are still maintained in these localities, is, in reality, the Tubercular leprosy or Greek elephantiasis; and, from this point, argue back, that the disease which formerly prevailed in Shetland,—and, if in Shetland, in Scotland generally,—was of the same nosological nature. On this head, however, I shall content myself with offering a very few observations in proof of the specific character of the malady in the districts lying most contiguous to Shetland, and leave without further comment the inference deducible from such evidence.

In the Faroe Isles.—These islands form the nearest land north of the Shetlands. The great cutaneous disease which formerly infected the inhabitants of Faroe had all the characters of tubercular leprosy. In proof of this, I may appeal to the description of the malady, given in the seventeenth century by Debes, who was Provost of the churches in these islands, and wrote an account, which was much esteemed at the time, of the country and its inhabitants. He observes, "as for the Leprosye itself I would not omit, for the reader's sake, to mention something of its nature. Physicians write that there are three sorts of Leprosies; namely, Tyria, from the serpent Tyrus. In this leprosy, the patient's skin is soft, and sometimes falleth off in shells, and they have many spots and white-wartes thereon. The second is called Alopecia, by reason the hairs fall off as those of a fox; he that is infected with this leprosy hath a red face, and his beard and eyebrows fall off. The third sort is called Elephantiasis, from the elephant, to whom they become like in their skin; the body and face of him that is infected with this disease is full of knobs. The Leprosie wherewith they are troubled in this country is usually Elephantiasis, for the face and limbs of almost all the infected are full of blue knobs, that break out sometimes as boyls, whereby they look very deformed in the face, being besides all hoarse, and speaking through their noses."*

Iceland.—That the leprosy of Iceland (the next land north of the Faroe Isles), is of the nature of the *Elephantiasis Græcorum*, is a point which might be proved by any of the descriptions of it by Petersen, Troil, Henderson, and Holland.† Dr Holland's account is more concise than the others. He states:

"The leprosy of the Icelanders, (*Likthra*, *Holdsveike*, or *Spitelska*), exhibits in many instances all the essential characters of the genuine elephantiasis or *Lepra Arabum*; and is a disease of the most formidable and distressing kind. Indolent tumours of the face and limbs are, generally, among the first symptoms of the complaint, attended by swellings of the salivary, inguinal, and axillary glands. The nostrils, ears, and lips are progressively affected with swelling deformity. The skin over the whole, or different parts of the body, becomes thick and hard; sometimes exhibiting a shining or unctuous surface, sometimes one rough and scabrous, which, at a more advanced period of the disease, displays numerous cracks or fissures. The senses are usually much enfeebled; and anæsthesia of the extremities generally occurs. The voice assumes a peculiar hoarseness and nasal tone, frequently with swelling of the tonsils, but without any hindrance of deglutition, until the disease has made great progress in the habits of the patient: the breath and perspired matter are extremely fetid; and the hairs and nails frequently fall off. The tumours in different parts of the body gradually pass into malignant ulcers, which discharge an acrid unhealthy matter; in this state the patient often lingers during a long time; or where the disease has a more speedy termination, all the symptoms are rapidly aggravated, and he is carried off in a state of extreme debility and wretchedness."*

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* Færoæ et Færoa Reserata (London, 1659), p. 310–11.

† See figures of Iceland Lepers in Plate V. Fig. 3, 5, 7.

The Lepers in Iceland are received into four different hospitals, which have been long established for that purpose.†

Norway.—Returning again to Shetland as a starting point, we find that the part of the Continent of Europe which lies nearest to Shetland, and that in nearly a direct line westward, is the district of Bergen in Norway. The distance between Shetland and the seaport of Bergen does not exceed thirty geographical degrees. In the first part of the present essay, I offered some reasons for believing that the Spedalskhed prevalent in Bergen was a disease different, on the one hand, from the Radesyge of other parts of Norway, and probably identical on the other hand with the Greek elephantiasis or Tubercular leprosy.

The descriptions of those authors who had observed the disease at Bergen seemed to justify this view. In 1751 Pontoppidan, the Bishop of Bergen, cites the account and words which we have above quoted from Debes in reference to the Faroe Isles, as exactly applying to the disease in the district of Bergen. When it at last (he states) breaks out in ugly boils on the face, they are generally sent to hospitals erected for that purpose, of which there is one at Bergen and another at Molde in Romsdalen.‡ The excellent account of the disease in the Bergen Hospital, which was drawn up a few years ago by the preacher Wellhaven, shows the malady to correspond in every important particular with the Greek elephantiasis;§ and the long and more strictly medical description of the Bergen disease given in 1786 by Buchner,‖ appeared to be altogether confirmatory of the same opinion. I have lately become acquainted with a proof to the same effect of such a strong character as to render it supererogatory to adduce the detailed descriptions of Buchner or Wellhaven in evidence. The Norwegian Government has recently, (and with an anxiety towards the promotion of medical science that reflects little honour on the other richer courts of Europe,) commissioned some of its more distinguished physicians to institute a complete inquiry into the nature of the endemic cutaneous diseases both of Norway and of other localities. Since the former part of the present paper was printed, Dr Fäye of Christiana has, as one of these Commissioners, visited this country with the purpose of examining into the nature of the Scottish sibbens, &c.; and I have learned from him with pleasure that the physician sent to Bergen to examine the Spedalsked, is prepared, after a careful study of the disease there, to report it as Tubercular leprosy, and hence a species of malady perfectly distinct from the more general Scandinavian Radesyge.

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* Mackenzie's Travels in Iceland during the summer of the year 1810, or Edinburgh Medical and Surgical Journal, Vol. viii. p. 202–3.

† Von Troil's Letters on Iceland, p. 123; Barrow's Visit to Iceland in the summer of 1834, p. 289 and 294

‡ Pontoppidan's Natural History of Norway, containing an account of its Climate, &c. &c. (London translation, 1755), p. 261, 262.

§ See Wellhaven's account extracted from the Transactions of the Stockholm Society, Vol. iii. p. 188—200, into Hunefeld's essay on Radesyge, p. 38—56.

‖ See p. 110—117 of the excerpta in Hensler's learned work, "Vom Abenländischen Aufsatze im Mittelalter." (Hamburgh, 1790.)

The date of the first appearance of leprosy in the Faroe Isles and in Iceland seems to remain undetermined.[*] In both localities it appears to have prevailed severely in the 15th and 16th centuries.[†] In all probability, however, it was introduced long previous to these dates. At all events, it appeared much earlier in Bergen, for, as I have already stated in the first part, one of the Leper hospitals in that city was founded as early as the year 1268.

There is no evidence, as far as I know, of the period of its first appearance in Shetland. It had reached, however, as far as the north of Scotland early in the 13th century; for as we have already shown, the leper hospital of Elgin was in existence in the year 1226,[‡] or more than forty years, at least, previously to the institution of similar receptacles for the diseased in Bergen.

ERRORS IN ADJUDGING INDIVIDUALS TO THE LEPER HOSPITALS—CAUTIONS INCULCATED BY THE MEDICAL AUTHORITIES.

While arguing, as I have done in the preceding paragraphs, to show that the epidemic leprosy for which so many lazar-houses were formerly founded in Europe and in Great Britain was the Greek elephantiasis, I by no means wish to insist that patients affected with that disease alone were admitted into these receptacles. There is only too great a probability for the belief, that persons who had the misfortune to be affected with any foul and inveterate cutaneous malady, were isolated and shut up along with those actually labouring under true leprosy. After Syphilis appeared towards the commencement of the 16th century with some analogous symptoms, and when the Elephantiasis itself was already disappearing from most localities, we know for certain that a large proportion of the inmates of the Continental lazar-houses consisted of cases of secondary venereal and other severe skin affections. Dr Bateman* adduces the strongest possible evidence in proof of this from the direct and personal observations made in the 16th and 17th centuries in the leper hospital at Ulm by Horst, at Alcmaer by Forrestus, and by Reedlin at Vienna. Similar errors were in all probability only too common even when the elephantiasis was more common and better known. And I believe I can adduce one piece of casual proof to show that in Scotland patients were occasionally consigned to our leper hospitals that were not the victims of genuine Leprosy. Elephantiasis never confines itself to an upper extremity, and there produces scabs. Yet in one case, at least, a patient affected with an extensive eruption of scales merely on one arm, (in all probability a case of psoriasis or impetigo,) seems to have been an inmate of the Rothfaun Leper Hospital. In some old Elgin MS. records lately published,† the case is alluded to, though certainly very incidentally. But I may quote the whole of the brief passage in which it occurs, though the passage itself is assuredly much more illustrative of the psychical than of the physical pathology of our forefathers.

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[*] The disease seems to be noticed under the name of Skyrbjugur in some of the oldest Iceland records. (See Olassen's Islansk Urtagraard Bok. p. 172; and Back in Von Troil's Letters on Iceland, p. 324.) Munk and Hunefeld suggest, with no great probability, that it might have been carried to the north by the expeditions which, during the 9th and 10th centuries, were made upon the Norman coast by Rolf and others. (See Hunefeld's Radesyge oder das Scandinavische Syphiloid, p. 57.)

[†] I have already referred to Bartholin in relation to its former prevalence in the Faroe Isles and Iceland. Writing in 1672, he states that in these parts leprosy "*fuisse olim familiarem*," (de morbis Biblicis in Mis. Med. p. 41.) Jonas, Pastor of Hitterdale in Iceland, wrote in 1662 to the celebrated Sir Thomas Browne, "Nullus *elephantiasi* vel abominabilior vel pestilentior hic existimatur, et tamen postremo hoc seculo pavendus se diffundit." (Wilkin's edition of Sir Thomas Browne's Works, including his Life and Correspondence, Vol. iv. p. 261.)

[‡] The date of admission to the Church of one of the Priors of the Hospital.

"The whilk day, (the 'whilk' unfortunately not being given,) ane gret multitude rushinge through the Pannis port (of Elgin,) surroundit ye order (or ordeal) pool, and hither wis draggit through ye stoure ye said Marjory Byssetth, in sore plight, wid her grey haires hanging loose, and crying 'Pitie ! Pitie !' Now Maister Wiseman, the samin clerk, who had stode up at her tryal, stepped forward, and saide, 'I kno this womyan to have been ane peacable and unoffendynge ane, living in ye privacy of her widowhoode, and skaithing or gainsaying no ane. Quhat have ye furthir to say again her ?' Then did ye Friaries agen repeate how that she had muttered her Aves backward, and othirs that ye maukin (hare) started at Bareflet, had ben traced to her dwellinge, and how that the aforesaid cattal had died by her connivance. Bot she hearing this cried the more 'Pitie ! Pitie ! I am guiltless of ye fausse crymes, never sae much as thought of be mie.' Then suddenlie there was ane motion in ye crowd, and ye peopel parting on ilk syde, ane *Leper* cam doun frae ye Hous, (the leper house,)‡ and in ye face of ye peopel bared his hand and his haill airm, *ye which was wythered and covered over with scurfs, most pyteous to behold*, and he said; 'At ye day of Pentecost last past, thys womyan did give unto me ane shell of oyntment, with ye which I annoynted my hand to cure ane imposthume which had cum over it, and beholde, from that day furthe untyll thys, it hath shrunk and wythered as you see it now.' Whereupon ye crowde closed rounde and becam clamorous; but ye said Marjory Bysseth cried pyteously, that God had forsaken her—that she had meanyed gude only and not evil—that the oyntment was ane gift of her husband, who had been beyond seas, and that it was ane gift to him from ane holy man, and true, and that she had given it free of reward or hyre, wishing only that it mote be of gude; but that, gif gude was to be payed back with evil, sorrow and gif Sathan mot not have his owin. Whereupon the peopel did presse roun and becam clamorous; and they tak ye womyan and drag her, amid mony tears and cryes, to ye pool and crie, 'To tryal! to tryal!' and soe they plonge her in ye water. And quhen as she went down in ye water, there was ane gret shoute; bot as she rose agayne and raised up her arms, as gif she wod have com up, there was silence for ane space, when agane she gaed doune with ane bubblinge noise, and they shouted finallie—'to Sathan's kyngdome she hath gane,' and forthwith went their wayes."

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* Synopsis of Cutaneous Diseases, p. 419.

† Rhind's Sketches of Moray, (1839,) p. 62 ; or Fullarton's Gazetteer of Scotland, Vol. i. p. 494. Foot-note with remarks by my friend, Mr Dove.

‡ See Account of Rothfan Leper House near Elgin in Part 1.

We can easily conceive that gross mistakes like the above in the selection of the proper inmates of the hospitals would constantly occur in these times, from the kind of persons to whom the responsible and important task of selecting the infected was entrusted. The Act that we have already quoted of the Perth Parliament "anent lipper-folk" defines those who were charged in Scotland with the duty of searching out the affected. In the third clause it is statute "That the Bishoppes, Officialles and Deanes, inquyre diligentlie in their visitation of ilk (each) Paroch Kirk, gif once be smitted (affected) with Lipper, and gif ony sik (such) be foundin, that they be delivered to the king gif they be Seculares, and gif they be Clerkes, to their Bishoppes, and that the Burgesses gar (oblige them to) keepe this statute under the paine conteined in the statute of Beggers, [namely, gif they have broken it (the statute of beggars) they sall be in fourtie shillings to the King]; and quhat leprous that keepis not this statute, that he be banished for ever off that Burgh, quhair he disobeyis, and in likewise to Landwart.")*

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* Murray's Edition of the Acts of the Parliament of Scotland, Vol. ii. p. 18. In Shetland, the kirk-sessions seem to have latterly taken upon them the legal powers conferred by the above act upon the bishops and other ecclesiastical authorities, as shown by the following extract from the Session Records of the parish of Walls. "Kirk of Walls, December 6th 1772.—This day the Session being informed that Margaret Abernethy, relick spouse of James Henry, had been, to all appearance, for a considerable time past, deeply tinted with the inveterate scurvy, commonly called

In extenuation to the above edict, we must recollect that, at the period at which it was enacted, (in 1427), the ecclesiastics to whom in this country it entrusted the selection of Lepers, were in reality the only existing physicians of the general community, and some of them seem to have devoted themselves as much to the practice of medicine as to the study of theology. But even to a strictly non-medical observer, the diagnosis would, in the latter stages, be less free from doubt, than might be at first supposed. For when once the Tubercular leprosy became in any case completely developed in all its distinctive deformity, and with its full concourse of marked and peculiar external characters, as falling off of the hairs of the eyebrows, swelling and thickening of these parts, tubercles of the face, hoarseness of the voice, &c. there were few or no diseases for which it could be readily mistaken, provided any proper degree of care were taken. In the earlier stages and less marked cases of the disease, errors in the adjudgment of cases, in all probability, often occurred, and affections that had no relation to elephantiasis, except in their obstinacy and locality, were, we cannot doubt, frequently mistaken for true instances of tubercular leprosy.

Such errors, it has been often averred, would be almost as apt to happen in the hands of the truly medical, as of the non-medical examiners, in consequence of the knowledge and distinction of cutaneous diseases being exceedingly imperfect at these early periods of medical history. And it is certainly true that, in the writings of the older Arabian, Continental, and English physicians, we find almost all the different species of chronic cutaneous disease mixed up and described together under a few general heads and designations, as Lentigo, Impetigo, Morphea, Albaras, Gutta Rosea, &c. Indeed, the proper discrimination and diagnosis of different cutaneous affections was little known and studied until the end of the last century. At the same time, however, it must be recollected that the Tubercular Lepra or Greek elephantiasis certainly forms a striking exception to this general observation. For, in the medical writings of the thirteenth, fourteenth, and early part of the fifteenth century, the Leprosy is almost uniformly described with a care and a minuteness that strangely contrasts with the superficial manner in which the whole remainder of chronic cutaneous diseases are either passed over or confounded together.

I would willingly appeal, in support of this last allegation, to the different chapters on Lepra, as compared with those on the other

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the Leprosy in this place, and was now removed to Brabaster in the midst of a number of children, whose parents were in the greatest fear of their being infected with that disease, by the said Margaret Abernethy, and that they and others had again and again called upon the Session to convene the said woman before them, in order to be sighted, and also to be set apart, if she should be found unclean, conform to former use and wont, in this and other parishes of the country. Therefore the Session did, and hereby do, appoint the officer, to require said Margaret Abernethy to compear before them at this place, next Wednesday, in order to be examined and inspected, as above said."—Extracted from the MS. Session Records of Walls.

cutaneous diseases, in the works of the Arabian physicians, and of those European medical authors of the middle ages whose writings I have already referred to. Indeed, the accounts and diagnosis of tubercular Lepra, as given by Rhazes, Theodoric, Lanfranc, Arnold de Villeneuve, Gilbert, &c. might well stand as models of medical description even at the present day. And if, in France, the strong and earnest injunctions of Bernhard Gordon were in any degree respected, that no person be adjudged as requiring separation for leprosy until the second stage (according to his division of the disease), had supervened, and the *signa infallibilia* of the malady had already shown themselves in the usual marks traceable in the *corruptio figurae et formae* of the suspected individual, cases of unjust condemnation to the lazar-houses would be much less common than might be otherwise imagined. We have already seen that in England in the fourteenth century, John of Gaddesden inculcated the same salutary rules and precautions, and insisted that no one be separated from the general community as a leper, unless already "*figura et forma faciei corrumpantur.*"

Certainly on some occasions the examination to which the patient was subjected, in order to ascertain if he were truly a leper or not, seems to have been of the most searching and scrutinizing nature. I have already alluded to the strict rules of examination that have been preserved for us in the works of different authors, and quoted the method recommended by Guy de Chauliac, to be followed by physicians before they remitted suspected patients with medical certificates to the magistrates, *(cum literis medicorum ad rectores.)* In the *Examen Leprosorum*, published by Gesner, and which appears to have been drawn up as an official formula, if I may so term it, for examining into suspected cases, the details are most elaborate and searching. There are between fifty and sixty signs of the disease which the examiner is requested to look for. Twelve of these signs are taken from the general state of the body; seven or eight of them from the hands and feet; six from the blood; five from the face; six from the mouth; eight from the eyes and eyebrows, &c. &c. The document commences by stating, "that it is the duty of the physician to be versed in, and attentive to, the signs of the disease, and to ponder often *(revolvere multoties)* upon them. He should put his trust, it adds, not in one sign, but in many, and he should see what signs are proper *(propria)* to the leprosy, and what are equivocal." Before making the examination, the document states that (as is also recommended by Guy de Chauliac* and others), the physician should, in the first instance, give some words of encouragement and consolation to the patient, and show that this disease is the salvation of his soul, and that Christ has not despised such, although the world may shun them (*quod haec aegritudo salus est animae, et tales Christus non despexit, licet mundus eos fugiat.*) Further, in order to have more certainty in the examination, it is added, that the patient should be made, in the first place, to take oath to tell the truth on those points on which he is interrogated. We have already found De Chauliac recommending the examining physician to take the same precaution, "faciat eos *jurare* veritatem dicere de interrogendis," (p. 310.)

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* In describing the duties of the examiner, De Chauliac observes, "In primis invocando Dei auxilium debet eos comfortare, quòd ista passio est salvatio animae et quod non dubitent dicere veritatem, quia si reperientur Leprosi, purgatorium

A decree, issued in the year 1314, by Milo, Bishop of Orleans, shows that it was occasionally necessary to guard the examinators against being imposed in other more serious ways, than by direct prevarications or misstatements on the part of the suspected individuals who were subjected to their scrutiny. "Whereas it happens that, in the examination of lepers, mistakes as to identity, and deceptions, are caused by the interposition of other persons, we enact and command, that whenever any person is suspected of the infection of leprosy, he be sent at his own charge if he have effects; but if not, that two responsible men of the parish having been sworn *(jurati)* before the priest and the officers of the church *(gajariis ecclesiae)*, be sent at the expense of the parish with the suspected person to obtain the examination; they shall conduct the said suspected person to the said examination, and cause him to be faithfully examined, and bring certificates to us, that it may not be possible that, for the future, collusion should take place in the aforesaid matters."*

I have not hitherto been able to find any evidence showing to whom the examination and seclusion of Lepers was, in olden times, entrusted in England; or to trace out in that kingdom any special laws relative to this subject. There exist, however, upon record, in reference to one English case in the fifteenth century, some details that are particularly interesting in regard to the present point of our inquiry. The details in question have been preserved in Rymer's Fœdera. The case to which they refer appears to have been brought under the cognizance of the Crown by the neighbours of the suspected female, in consequence of her being alleged to be affected with leprosy, and yet refusing to seclude herself, as was the usual custom, from intercourse with society in consequence of it. The reigning monarch, Edward IV. issued, in 1468, a Chancery warrant for the proper medical exami-

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animae esset; et si mundus habet eos odio, non tamen Deus, cum Lazarum Leprosun plus dilexit quam alios. Si autem non reperientur tales stabunt in pace." P. 310.

* From the "Statuta Milonis Episcopi Aurelianensis, anno MCCCXIV. in Synodo autumnali edita" contained in Martene and Durand's Amplissima Collectio veterum Scriptorum et Monumentorum. (Paris, 1733.) Tom. vii. p. 1286.

nation of this supposed case of the disease. The royal warrant, and the medical certificate which it called forth, have both been preserved by Rymer. I append a translation of these curious documents, as illustrative both of the general dread then still entertained of the malady, and of the minute care which, in this country, was occasionally taken, in order that a just and accurate judgment might be arrived at in cases of doubt and difficulty. The documents are entered by Rymer under the title of "Medicorum Regis, super morbo Lepræ, Certificatio." They proceed as follows:—

"To the most Excellent and most Serene Prince and Lord in Christ, Edward, by the Grace of God, King of England and France, and Lord of Ireland, We, William Hatteclyff, Roger Marshall, and Dominus de Serego, Doctors of Arts and Medicine, your Physicians, and sworn to watch over the health of your Person, send due Reverence with humility and worship;—

"Whereas a Petition was made to You in Your Court of Chancery, with regard to removing *Johanna Nightingale* of Brentwoode, in the County of Essex, from general intercourse with mankind, (*a communi hominum consortio*), because it was presumed by some of her neighbours that she was infected by the foul contact of Leprosy, and was, in fact, herself a Leper: Upon which Your writ was then prepared, and afterwards directed to the Sheriff of the said County, in these words:—

"Edward, by the Grace of God, King of England and France, and Lord of Ireland, to the Sheriff of Essex, Greeting: Whereas We have heard that *Johanna Nightingale* is a leper, and is commonly holding intercourse with the people of the aforesaid County, and mixes with them both in public and private places, and refuses to retire to a solitary place, as is customary and befitting her, (*et se ad locum solitarium, prout moris est, et ad ipsam pertineret, transferre recusat*), to the grievous injury and, on account of the Contagion of the aforesaid disease, the manifest perils of the aforesaid inhabitants: We, willing to guard against such dangers, as far as in us lies, and as is just and customary in such cases, Do charge You, that having taken with You certain discreet and loyal men of the County of the aforesaid *Johanna*, in order to obtain a better knowledge of this disease, You go to the aforesaid *Johanna*, and cause her to be diligently viewed and examined in the presence of the aforesaid men. And if You find her to be Leprous, as was reported of her, then that You cause her to be removed in as decent a manner as possible, from all intercourse with other persons, and have her betake herself immediately (*indilatè*), to a secluded place, as is the custom, lest by common intercourse of this kind, injury or danger should in any wise happen to the aforesaid inhabitants. Witness my hand, at Westminster, this day of July, in the eighth year of Our reign."

"Wherefore The Reverend Father in God, Robert, by the Grace of God, Lord Bishop of Bath and Wells, Your Chancellor of England, consulted us on this subject, and determined to bring the same Johanna to us, with the intention that, according to what we have learned from our knowledge of Medicine, we should give information to Your Highness in Your Chancery, whether the said Johanna be in fact a Leper or not. We, therefore wishing to obey Your Highness, in order that the truth on this subject might be made most plain and clear, have proceeded after this manner. First, we examined her person, and as the older and most learned medical authors have directed in these case, we touched and handled her *(ipsam tradavimus et palpavimus)*, and made mature, diligent, and proper investigation, whether the symptoms, indicative of this disease, were in her or not; and after an examination and consideration of each of the points, which appeared necessary to be examined and considered, in order to arrive at a true knowledge of this doubful matter, We found that the woman neither had been nor was a Leper, nor ought, on that account, to be separated from ordinary intercourse with mankind.

"We are taught by Medical Science, that the disease of Leprosy is known by many signs, also that each species of the disease, of which there are four, viz. Alopicia, Tiria, Lonina, and Elephantia should be known and characterised by particular signs, and each should be specifically distinguished from the rest. Therefore, in the case of the woman brought before us, on going through upwards of twenty-five of the more marked *(famosiora)* signs of general Leprosy (*Leprae in communi*,) we do not find that she can be proved to be Leprous, by them or a sufficient number of them. And this would suffice, generally, to free her from the suspicion of Leprosy, since it is not possible for any to labour under the disease, in whom the greater part of these signs are not found. But, in order to give our opinion on the individual species, going through upwards of forty distinctive signs of the different varieties of Leprosy, we do not find that this woman is to be marked as suffering under any of the four kinds, but is utterly free and untainted, as we have signified by word of mouth to Your Highness in Your said Chancery, and We are prepared to declare the same more fully to Your Highness by scientific process *(per processum scientificum)*, if and wherever it shall be necessary.

"In testimony whereof, we, the said William Hatticlyff, Roger Marshall, and Dominus de Serego, have signed our name with our proper hands, and alternately affixed our seals."

To the preceding document, which is one of the earliest, if not the very earliest, English medical certificate which either historical or medical records have preserved, it is added in the form of a note, " Et memorandum quod praedicti Willielmus Hatteclyff, Rogerus Marchall, et Dominus de Serego venerunt in Cancellarium apud Westmonasterium, septimo die Novembris, anno praesenti, (1468,) et recognoverunt scriptum praedictum, et omnia contenta in eodem, forma praedicta."[*]

Explanation of Plate V.

Fig. 1. Case of Tubercular Leprosy from Shetland, (see Berns' case, p. 144.)
2. Case from Madeira, (from Adams.)
3, 5, 7. Cases from Iceland, (from Gaimard.)
4. Case from Java, (from Cleyer and Schilling.)
6. Case in the Hospital de St Louis, Paris, 1836, (from Willis.
8. Case in a boy born of English parents, but brought up in the Bahama islands, (from Bateman.)

(Third and concluding Part in the next Number.)

ART. XI.—*On the Signs of Pregnancy during the earlier months of Gestation : and on the existence of a new Animal Principle in the Urine during that State.* By JAMES STARK, M. D., Fellow of the Royal College of Physicians, Edinburgh.

MOST of the writers on midwifery and on legal medicine state, that pregnancy cannot with any certainty be detected till the movements of the fœtus are distinctly perceived within the womb. This does not, in general, happen till the fourth month is completed, or even later. Hence Dr Gooch[†] states, that we should " never give an opinion till six months have elapsed ;" Beck,[‡] that " an opinion should seldom be hazarded before the end of six months ;" Blundell[§] would rather " wait ten or twelve months, than give an erroneous opinion ;" whilst Orfila,[||] Foderé,[¶] Mahon,[**] Capuron,[††] Burns,[‡‡] Velpeau,[§§] and a host of others, all agree that no certain sign exists by which pregnancy may be detected before four complete months have elapsed, and quickening, or the living motion of the child, be accurately ascertained. Even Dr Montgomery, in his elaborate work on the "Signs and Symptoms of Pregnancy," and Dr Evory Kennedy, in his instructive "Observations on Obstetric Auscultation," speak in very vague terms of the signs by which pregnancy may be detected before three months have been completed.

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[*] Foedera, Conventiones, Literae et cujuscunque generis Acta Publica inter Reges Angliae et aliosquosvis Imperatores, Reges, Pontifices vel Communitates. Vol. xi. (London, 1710,) p. 635.

[†] Practical Compendium of Midwifery, 12mo. London, 1831, p. 103.

[‡] Elements of Medical Jurisprudence, 6th edition. London, 1838, p. 133.

[§] Principles and Practice of Obstetricy. London, 1834, p. 172.

[||] Traité de Medecine Legale, 4 Vols. 8vo. Paris, 1836, Vol. i. p. 261.

[¶] Traité de Medecine Legale, 6 Vols. 8vo. Paris, 1813, Vol. i. p. 435.

[**] Traité de Medecine Legale, Paris, 1801, Vol. i. p. 153.

[††] Cours Theorique et Pratique d'Accouchemens. Paris, 1816, p. 107.

[‡‡] Principles of Midwifery, 9th Edition. London, 1837, p. 242.

[§§] Traité Complet de l'Art des Accouchemens, 2 Vols. 8vo. Paris, 1835, Vol. i. p. 191.

As it is, however, of the utmost importance, especially in a medico-legal point of view, to be able to ascertain the existence of pregnancy at an early period, and as I am not acquainted with any work which professes to give a detail of symptoms on which reliance can be placed, till three months at least have elapsed, I hope the present imperfect detail of the results of my own experience, will induce others who enjoy more extensive opportunities of observation to verify the statements which I now venture to lay before the profession.

The following remarks are intended to apply solely to the signs of pregnancy during the first three months of gestation, as I think that no one who has attentively perused the works of Drs Kennedy and Montgomery, and had a little practical experience, could fail to detect the presence of pregnancy after this period.

I adopt Dr Kennedy's division of the signs of pregnancy, viz. *1st*, Those which depend on the representation of the individual supposed to be pregnant, and *2d*, Those sensible to the medical attendant.

1. *Representative Signs.*—These are extremely variable and numerous, and scarcely two women will be met with in whom pregnancy declares itself by the same sensations. All or almost all of them may be entirely awanting, and, on this account, I shall notice them very briefly. It is commonly stated, that, at the moment of conception, involuntary shudderings, with an indescribable feeling of pleasure and tendency to fainting, occur, which are succeeded by a feeling of languor and lassitude, together with a peculiar thrilling sensation or vermicular motion in the bowels, or with slight colic pains. These are far from being constant symptoms, and I have reason to believe that they are the exceptions, not the general rule. Few women can tell the week or month, far less the day on which they conceive; and M. Dubois* states that, of 100 pregnant women whom he examined, no fewer than 38 could give not the slightest clue as to the period when they became pregnant, and the others only calculated the period of their conception from the time when they had last menstruated.

Soon after impregnation, however, in most cases, though not always, sickness is experienced on rising in the morning, and is also excited by the tightening of the clothes or pressure on the stomach. Retching and vomiting sometimes attend, together with a depraved, excited, or diminished appetite. The nausea is peculiar; as, after vomiting, it completely disappears and leaves a craving desire for food. Faintings, febrile feelings, quickened circulation, flying pains in various parts of the body, toothache, headach, numbness, and cramps in the lower or upper extremities, constipation or diarrhœa, and irritability of the bladder, are common occasional symptoms. The most important of this class of symptoms are the suppression of the menstrual discharge, and the peculiar sensations experienced in the mammæ. In almost every case shortly after impregnation, peculiar sensations are experienced in the breasts. These have been generally described as a sensation of creeping or formication, with a fulness and heat in the interior, and an itching over the surface, which causes the woman frequently to put her hand to the breast to relieve the unpleasant sensation. I have been frequently informed by those who have born several children, that this was the first sign they experienced, by which they were made aware they were again pregnant; and this before they were able to judge whether they really were so from the suppression of the menstrual discharge.

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* Orfila, Medecine Legale, Vol. i. p. 256–9.

The suppression of the menstrual flux generally takes place from the date of impregnation, but not always. In some instances it continues for a few months, and then disappears till after delivery; in others it continues during almost the whole of pregnancy. It has been much disputed whether the discharge which appears during pregnancy, at the monthly periods, be really true menstruous fluid or not. I have not the slightest doubt that it is so, as I have met with two cases in which I had opportunities of satisfying myself that the discharge was perfectly natural, and not to be distinguished from the true menstrual flux. In the one case, a scrofulous woman with red hair and fair skin, it continued always for the first three months after impregnation, and I witnessed this fact during three pregnancies. In the other case the discharge was just as regular for seven months, when it stopped, but returned immediately on delivery. This woman was very swarthy, with black hair and eyes, and it occurred during two pregnancies. I have also seen coloured discharges attending the progress of pregnancy, but never was able to discover that they observed periodical returns. It may, however, be stated, as a general fact, that, during pregnancy, the menses are suppressed; and if this were found occurring in a married woman, together with several of the above symptoms, it would amount to strong presumptive proof that she was pregnant.

2. *Sensible Signs.*—These are by far the most important, and, in fact, are the only ones by which the physician ought to be guided in forming his opinion on any case presented to him. If the woman is married, the representative signs, if borne out by the sensible ones, will go far to guide the medical attendant; but

if the woman be unmarried, it is always best to follow Dr Gooch's advice—"never believe their tongues." The sensible signs, then, which I purpose to notice in succession, are those connected with the mamma, nipple, and its areola, the shape of the abdomen, state of the uterus, the stethoscopic indications, and the examination of the urine.

Almost immediately after conception the mamma begins to enlarge, and becomes the seat of increased action. The veins are full and distended; the glandular structure becomes more developed, the whole breast enlarges, and one or more of the glandular lobules may be felt hard, enlarged, and painful on pressure. The whole of the glandular lobules are not equally affected; in general two or three only in each breast; and this appears to arise not so much from secretion of milky fluid within these structures, as from irregular determination of blood and congestion within these parts. This appears to be especially the case in a first pregnancy. In a woman who has born children, milk often remains in the gland from one pregnancy to another, and may be drawn from her nipples at this early stage; and even in those in whom the breast remains flaccid, I have in almost every instance during the first month detected one or more of the lobules enlarged and somewhat indurated, so that I am inclined to regard this state of the breast as pretty constant, and one which, when taken along with other symptoms, is of great value.

About the middle or end of the second month, these hardened lobules become softened, and the breast presents a more uniform resistance to the hand; the distribution of blood, in fact, appears to be more uniform, and the local congestions, to which cause I referred the occurrence of the partial lobular enlargements, appear to abate.

During the third month, the breasts continue progressively to enlarge, and milk to be secreted within the glandular structure from which it may be expressed. They present a uniform enlargement; the glandular lobules are rarely the seat of painful sensation, and are scarcely to be distinguished from the other parts of that structure. In women who have born many children, however, and whose breasts remain flaccid, the only change observable at this period is, that the hardness of the lobular structure has disappeared, and that, though the breast remains soft and flaccid, milk may be drawn from the nipple.

The nipple from the commencement of pregnancy participates in the increased action of the other structures of the breast. It becomes more prominent and larger,—in fact, undergoes a kind of erection, and projects from the breast more than formerly. This is especially remarked in women who have had children, in whom, after lactation, the nipple shrivels into a dry, wrinkled, little knot or button, and sinks, from the pressure of the clothes, into the substance of the breast. The skin around the base of the nipple at the same time becomes softer, and is bedewed with a moist unctuosity, sensible to the touch. During the first month, the glandular follicles which are seen around the nipple, but very small in the virgin state, become enlarged, and can be sensibly detected when the point of the finger is passed over them. At this period, in a first pregnancy, these bodies are not very sensible to the sight, and their colour does not differ from that of the immediately surrounding skin; but in subsequent pregnancies, even by the end of the first month, they are seen of a smooth aspect, and a whiter or paler-yellowish tinge than the surrounding skin.

In a first pregnancy, it is not in general till towards the end of the second month or the beginning of the third, that these glandular follicles are found presenting all the characters which they afterwards assume. They are then seen varying in number and size surrounding the base of the nipple, and extending for a greater or lesser space around it. Their size varies from that of a millet to that of a hemp-seed, and they assume during this period a paler, sometimes a redder hue than the surrounding skin. They also present a smooth polished-looking surface, and the skin which surrounds the nipple and them is evidently softer, moister, and more unctuous than that of the surface of the breast. It is to this portion of skin surrounding the nipple that the term *areola* has been applied.

During the third month these characters are more marked and easily recognized, and the glandular follicles are more distinctly formed, and differ in colour from that of the surrounding areola.

Areola.—For the first six weeks of a first pregnancy, little or no change of colour is usually perceptible on the areola. If, however, the person be of a dark complexion, with dark hair and eyes, about the end of this period a pale rosy hue may be seen spread over the nipple and areola, most generally, however, occupying the nipple only. In fair persons, no perceptible change of colour has taken place. By the end of the second month, however, in dark or brown-haired women, the pale rosy tint is in general distinctly perceptible both over the nipple and the areola, but in fair people it is still difficult of recognition. This change of colour of the areola is most easily recognized when the breast is looked at from a distance of a few feet, when the slightest change of colour may be detected; whereas, on a close examination, I have several times found I had overlooked it. By the middle of the third month, or ten weeks after conception, the areola has usually assumed a leaden hue or a deeper rose, with a tinge of dirty yellow or brown, and is so apparent as to be detected the moment the breast is exposed. If, however, the person be fair, the tint, though in substance the same, is still faint, yet quite distinct enough to make it be easily recognized. I have frequently been astonished at the difference in tint which the recurrence of the menstrual period produced. Thus I have found that when the breast was examined the ninth week, (or the week before the third monthly period from the last appearance of the menses,) the areola could scarcely be distinguished as differing in colour from the surrounding breast, whilst the very next week, from the monthly period having arrived, the areola was seen quite distinctly. From this period the areola gradually deepens in colour, till, in swarthy women, it becomes almost black; in others, of all varying shades, from that to a dirty rose or brownish rose hue. Both in fair and dark women it is in general quite distinct by the end of the third month; but in neither is the tint so deep as after the next menstrual period, for it is at these periodic times, it seems chiefly to deepen its tint.

Such are the changes which the areola presents in a first pregnancy. But nothing of what is stated above can apply to the areola of a woman who has born children. In her, the areola once produced, never entirely fades, so long as she remains capable of procreating; and though I have in some cases seen the colour nearly vanish when the period was long which intervened between the nursing of one child and the conception of another, still it was always visible, and few who have examined the female breast could have failed to recognize many marks by which it would be known that the woman had once been pregnant. The glandular follicles, too, once enlarged, never entirely disappear during the procreating period of life, and the areolar surface is seen traversed by a reddish white, shining, cicatrix-looking, irregular net-work of lines, which remain during life. This is an important fact for the medico-legal inquirer; for, I know of no disease which will give rise to the formation of the coloured areola, with the enlarged glandular follicles; so that when the remains of these characters, together with the cross lines above alluded to, are observed on a breast, the only conclusion is that the person had once been pregnant.

In the woman who has previously born children, by the end of the first month the glandular follicles, which had considerably shrivelled since last pregnancy, have again assumed nearly their original enlarged and smooth appearance, and contrast remarkably with the darkened areola. In them, very soon after conception, certainly after the first menstrual period, the cuticle over the areola becomes perceptibly softer, and moister; the old cuticle covering it is in process of being cast off in scales; and the colour, whatever tint it may have previously been, is perceptibly deeper. In those fair persons in whom it had nearly disappeared, it is usually as deep by the end of the second month as it is by the third in those who are pregnant for the first time; but in the dark-complexioned, I have frequently been unable to detect any increased depth of hue after the second month, the areola being then perfect in all its characters. In general, however, the third month has elapsed before it has attained its full perfection.

Scarcely any writer on midwifery notices this difference of the time of appearance of the areola in those who are pregnant for the first time, and those who have born children, and yet the circumstance is important; for, if it be allowed that the areola takes four months to become perfect in all its characters, in a first pregnancy, we would be apt to be led astray by expecting to find an enlarged and apparent uterus whenever we detected a dark areola; and thus, this, which, when rightly applied, is a most valuable sign, would fall into disrepute. Whoever consults the works of Burns, Blundell, Kennedy, Velpeau, and Orfila, will be fully sensible that the small consideration in which these authors respectively hold the appearance of the areola, results from this circumstance. They observed that the areola once produced remained more or less permanent, and they drew the conclusion that its appearance could never again serve to indicate a pregnant state. They overlooked the marked difference between the areola of the pregnant mother, and the areola of the mother who was not bearing, and, because their own observation had not led them to notice the differences of these two states, they rejected this sign of pregnancy altogether.

But there are other reasons which these authors assign for their neglecting the areolar signs, and these are, that a coloured areola occurs in some uterine affections, and that several females never have any coloured areola, either during pregnancy or during lactation. Each of these points shall now be noticed.

Almost every writer who has noticed the signs of pregnancy has remarked, that a dark areola may occur in virgins during particular diseases, such as dysmenorrhœa, diseases of the uterus, &c. Hence it follows that Gooch and others, attending merely to the change of colour, allowed themselves to be misled by confounding the coloured nipple or areola of the one with the greatly altered areola of the other. That it is perfectly possible to distinguish between the one and the other, my own limited experience has proved. I have only met with three cases in which there was a coloured nipple and areola, and no pregnancy existed; but the character of the areola, taken in connection with the other symptoms, was sufficient to enable me to distinguish them.

The first case occurred in the month of August 1835, and was the means of directing my attention more especially to the changes in the areola produced by pregnancy and by disease. A young woman of 18 was supposed by her parents to be in the family-way, and they wished to force the young man who was suspected to be the cause, to marry her if it was proved she was so. It is unnecessary to relate the case in full. She had many of the symptoms referred to pregnancy, as suppression of the menses, swelled abdomen, painful breasts, frequent attacks of headach and vomiting, &c. I declined giving an opinion the first time I saw her, but a fortnight after, called back again and found the nipples dark and surrounded by a coloured areola, precisely of the same appearance as that surrounding her eyes. The nipple was, however, small, shrunk, not projecting, the areola dry and wrinkled, the glandular follicles not enlarged, but the breasts painful and with a knotty feeling. I was informed, however, that she had a severe attack of bilious vomiting and purging, severe pains in the back and loins, and that the menstrual fluid had appeared in small quantity. No doubt, therefore, existed regarding the nature of the case.

The second case was in a chlorotic woman, who had been married for many years, and had never had any children. It was one of the best marked cases of chlorosis I have ever seen, and, as I attended her for months afterwards, I can speak positively of the fact of her not being pregnant at the time I attended her. In her the nipple and areola were at every menstrual period though no menstrual secretion appeared, of a faint watery black colour, but there was no turgescence of the nipple, no moistened and softened state of the areola, and no enlargement of the glandular follicles.

The third case was in an unmarried female, 36 years of age, who was labouring under medullary sarcomatous disease of the uterus, which proved fatal. She had a retracted nipple with a dark areola; and my attention was first directed to it, in consequence of her neighbours having asserted from this circumstance that she was with child. She lived for about eight months after I first saw her, and at the time of her death the uterine tumour had increased to about the size of a child's head, and was found to consist entirely of morbid parts,—the body of the uterus being studded with tubercles of different sizes in various stages of softening, and a large ulcerated fungoid bleeding mass filling its cavity,

The character, then, of the areola in all these cases was recognized as different from the areola which attends pregnancy, so that I quite agree with Dr Montgomery in regarding the presence of an areola with the characters above described as indicating a state of pregnancy; and I have no hesitation in asserting, that, in every case where a well-characterized areola is found, there also will the uterus be found to contain a fœtus.

I now turn to the last objection to the areolar test, in order to show that the want of a coloured areola in some women ought never to be held as an objection to its presence in others indicating a state of pregnancy in them.

The entire absence of all colour from the areola is far from being uncommon. I have at this moment, (9th November 1841,) under my care, no fewer than two patients, in neither of whom, either during pregnancy or lactation, has the slightest change been observed in the colour of the nipple or areola. The one is very fair, with light hair; the other very dark, with hair originally of a jetty black, now gray. In both, however, all the other characters of the areola are well-developed, at least sufficiently so to make them be easily recognized. From the examination of the breasts alone, taken in connection with the representative signs, I was able in one of these cases to indicate the occurrence of pregnancy at a period which, calculating from the time of delivery, must have been about two months, certainly not more, after conception; and I believe that, if the breasts were more frequently examined by practitioners, it would be found that the absence of a coloured areola is far more common than it is usually supposed to be. In two classes alone of patients have I met with this anomaly; in the very fair, and in those whose hair has become gray in early life.

For individual anomalies it is impossible to account. Dr Montgomery met with a case of pregnancy, in which the glandular follicles were not developed, but the dark areola was, and all the other characteristic marks. But because such cases may possibly occur, we ought not to reject a sign which, while it is one of the most constant, is one of the earliest met with in pregnancy, and which, if more generally attended to, might perhaps render the ascertaining the presence of pregnancy at an early period nearly as sure as the stethoscopic examination does at a later period.

That practitioner, however, would be highly culpable who would form his opinion from one or two favourite signs or symptoms. His opinion ought to be formed from a consideration of every ascertainable symptom,—both those which are narrated by the patient, and those which come under his own observation. Regarding the question of pregnancy, in most cases where the woman has no object to serve by concealing her real symptoms, her narration may greatly aid our diagnosis; and it may be unnecessary to make any further examination than into the state of the breasts. Where the woman has an interest in concealing her pregnancy, or in declaring herself pregnant, although she be not, the above-noticed signs must not be trusted to alone; but others ought to be conjoined, which, from all bearing on the same point, render that certain which, from one or two signs only, might be left undecided.

Considerable stress is usually laid by writers on midwifery on the sharpening of the features and the bloached countenance sometimes observed during pregnancy. These appearances are not very general; but, when they are present in one who was previously healthy, they ought to be taken into consideration alongst with the other appearances.

Abdominal Enlargement.—The swelling of the abdomen is a symptom of pregnancy of much greater importance. Very shortly after conception, the abdomen is observed to become more tumid than formerly. This, of course, cannot be owing to any increase in the size of the uterus, but to the sympathy which the stomach and bowels have with this organ, this sympathy being shown by the sickness, nausea, vomiting, and copious flatulent eructations, together with the windy distension of the bowels. During the first two months of pregnancy, this swelling of the abdomen is rarely wanting, and is frequently a very marked symptom, and possesses characters which I have never seen imitated by any other female disease. At the same time that the abdomen is tumid or greater in bulk than formerly, there is also observed to attend it a peculiar flatness over the anterior, and what would otherwise be the most prominent part of the swelling. Most works on midwifery notice a flattening of the abdomen as a symptom of pregnancy, but then, from their descriptions, it does not appear that they ever remarked that the flatness only appears at that time when the actual volume of the abdomen is enlarged. They all attribute it to the sinking of the uterus in the pelvis during the early months of pregnancy; yet one moment's reflection must convince every one, that the sinking of such a small body as the uterus during the first two months, even though it took place to a much greater extent than it was supposed to do, is quite unable to explain the marked flattening of the abdomen. But the fact is, that the fundus of the uterus does not sink in the pelvis at any stage of pregnancy. The flattening of the abdomen, then, only occurs after it has become considerably increased in volume, and, as far as my observation goes, seems to be caused by the recti muscles of the abdomen opposing a greater resistance to the distending force than the transverse muscles; and, as the swelling at this time consists entirely of flatus, this is pressed against the least resistant parts of the abdominal cavity, and so gives rise to the appearance of flattening by jutting out at the sides, whilst it is tied firmly down in front. This peculiar flat tumidity of the abdomen is most observable during the first two months of pregnancy, and in general, after this period, disappears to such an extent as to make it doubtful if the person be pregnant. About the middle of the third month, however, slight fulness at the lower part of the abdomen begins to manifest itself, and by the end of the month is sufficiently apparent to be recognized both by the hand and the eye. As a woman often adjusts her dress so artfully at this period as to render it extremely difficult to recognize any increase of size in the abdomen, it ought to be borne in mind that, by taking a lateral view of her shape when she is desired to pass before us, the enlargement may be detected from the increased lateral breadth at the haunches; and if a manual examination be allowed, the fact may be easily ascertained.

State of the Uterus.—Most authors on midwifery speak in very vague terms of the position and progressive enlargement of the uterus during the first three months; and almost all state that, for the whole of that period, the uterus is still confined within the pelvis.* Even Orfila mentions that, by the end of the third month, the fundus of the uterus has only arrived on a level with the pubes. Orfila's description of the position and state of that organ for the first two months of gestation is the most precise I have seen, and is quite in consonance with my own observation. He states† that, during the two first months, the volume of the uterus gradually increases; its body becomes somewhat rounded and inclines backwards, whilst its neck approaches nearer to the vulva, and comes more within reach of the finger. Such is the result of his own observation; and then he adds, on the authority of others, that the uterine orifice becomes closed, whilst the margin of the lips become equal, and the orifice, from being a somewhat triangular cleft, becomes round and more gaping, the heat of the parts being also increased. In addition to these characters it might be added, that the lips and neck of the uterus have a softer and more spongy feeling than they have in the virgin state, and are evidently enlarged by increased vascular action, and the lips often gape, so that the tip of the finger may be introduced for a small way within them. The lengthening of the posterior lip of the uterus, so as to bring it on a level with the anterior, is a character to be met with only in women who have never before been pregnant. After the uterus has once been enlarged by pregnancy, the only characters to be depended on are those stated by Orfila, as the results of his own observation; all the other characters are equally met with in women who have born children, but who are not at the time pregnant.

It is requisite to notice, that it is during this condition of the uterus that what authors on midwifery call the "falling down of the uterus within the pelvis" occurs, to which they erroneously attribute the flattening of the abdomen. Now what is it that actually happens? Does the uterus really sink in the pelvis during the first months, or is the sinking only apparent? To ascertain this point we must first glance at the position of the virgin uterus in the pelvis, and especially as to its depth from the external orifice of the vagina.

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* Kennedy, p. 38; Blundell, p. 172; Baudelocque, Vol. i. p. 132; Burns, p. 241; Capuron, p. 117.

† Orfila, Medecine Legale, Vol. i. p. 246.

The usual length of the virgin vagina is estimated to be anteriorly from the pubes three inches, and posteriorly from the fourchette four and a half inches. Into the further extremity of this tube, projects the mouth and a portion of the neck of the uterus. Such being its position, in general, about half an inch of its neck and its mouth, can be reached with the point of the finger. When the fundus of the uterus enlarges in consequence of pregnancy, it must occupy more room, and, as the bladder opposes its projecting forwards, and the promontory of the sacrum resists at first its rising upwards, it is necessarily thrown backwards against the rectum and hollow of the sacrum. As the body alone of the uterus continues to enlarge for the first two months at least, whilst the fundus is pressing against the hollow of the sacrum, and gradually following as it were its curve, the lower moveable part, or the neck and mouth, having nothing to resist their advance towards the vaginal orifice, are pressed downwards and forwards, so as to bring them more within the reach of the finger; so that sometimes, as Madame Boivin states, the neck of the uterus appears to have become greatly lengthened, as two inches nearly may be within reach of the finger. This lengthening, however, is merely apparent, and is owing to the body of the uterus being prevented from rising out of the pelvis, in consequence of its fundus being as it were held down by the bladder before, and the promontory of the sacrum behind, whilst the flatulent distension of the bowels oppose an additional obstacle to its immediate upward ascent. By the end of the second month, however, if the bladder be emptied, and the patient be thin, the uterus may be felt, by those who have a nice sense of touch, on a level with the brim of the pubes, so that at the very time when all authors assert that the uterus is sunk further down in the pelvis, it has actually risen to the extent of nearly two inches above its position in the virgin state.

If this were not the case, how does it happen that the very next month, nay, the very next week after the second month is completed, the neck is already felt shorter from having somewhat ascended, and its position somewhat changed? If it arose from the lengthening of the neck, and not from the enlarging body of the uterus being prevented from rising, the neck would still be within reach of the finger during the third month, and in persons who died during this period of gestation, the lengthening of the neck would be apparent. But this is not the case. In no preparation of the gravid uterus during the first two months which I have yet examined, have I been able to detect any appreciable lengthening of the neck ; and in every case in which I have had an opportunity of examining the living patient, I have been satisfied that the elongation of the neck was merely apparent, and, owing to the fundus of the uterus being at first prevented from rising much higher than during the virgin state, its increasing volume pushing downwards and forwards the mouth and neck. Here, then, is no depression of the uterus in the pelvis during the early stages of pregnancy, and, consequently, the flattening of the abdomen can never be attributed to this cause, but is evidently owing to that which I have assigned for it.

Such, then, is the state of the uterus during the first two months of gestation, and though a vaginal examination may teach us but little during that period, still in doubtful cases, especially if they be the subject of a medico-legal inquiry, it will always be advisable to make this examination, for if it gave no positive evidences of the existence of pregnancy, it might give valuable negative results.

During the third month, the uterus, gradually augmenting in volume, is found to have advanced upwards and forwards, so that the fundus during the early part of the mouth is found behind and on a level with or slightly above the level of the anterior brim of the pelvis, and in the latter portion of the same month from one to two finger-breadths above it. It is in a thin person distinctly perceptible, on a careful examination, by the end of the tenth week ; but in all, unless they are very much loaded with fat, may easily be detected by the hand by the end of the twelfth week. The changed position of the uterus, as it lies then in the axis of the upper brim of the pelvis, throws the neck and mouth of that organ backwards ; and as the fundus is no longer prevented from rising by the causes above-mentioned, the neck is found to have receded so far as to be nearly beyond the reach of the finger. If at this period a vaginal examination be made, and at the same time, with the other hand, pressure be made over the pubes, the enlarged uterus may be made to roll over the finger. I have never been able, however, to detect the dropping of the fœtus on the finger (ballottement) during this month, though Burns* asserts that it can ; but as he is the only one known to me who has perceived this at such an early stage of pregnancy, it is possible he was mistaken. At this period of pregnancy, the fœtus is too small to be distinguished floating in the cavity of the uterus, differing, as it does, so little in specific gravity from the fluid which surrounds it; and, by the almost unanimous consent of all observers, it is not till the end of the fourth month that this character becomes distinctly marked.

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* Principles of Midwifery, 9th edit. p. 244.

By the end of three calendar months, the uterus, in almost every case, may be distinctly felt, its fundus being two finger-breadths above the brim of the pubes.

Auscultation.—This has for many years past been reckoned one of the surest means of detecting the presence of a fœtus in the uterus, and it is to Mr Kergaradec [*] of Paris that the medical world are obliged for adding this most important element of diagnosis to those stated above. There is, however, a considerable difference of opinion as to the period of pregnancy when this means of diagnosis becomes available. Dr Kennedy states that he has heard the peculiar placentar souffle by the end of the tenth week, and at all periods after that; whilst others have not been able to detect it till the fifth month. It has also been much disputed as to whether this sound was produced by the motion of blood in the placenta, or by that in the aorta and iliac arteries, or was occasionally heard over the placenta and occasionally over other parts of the uterus. It is not necessary to enter into this controversy, as I am satisfied, from repeated examinations with the stethoscope, that it is only present when the uterus is enlarged from the presence of a fœtus; but as to whether it is produced by the motion of the blood in its utero-placentar circulation, or by the spiral vessels of the uterus itself, remains for further investigation. In the latter months of pregnancy, the sound is only perceived over the region where the placenta is on delivery found to be attached.

During the first ten weeks after conception, I have never been able to detect the placentar souffle, but I have noticed it in the beginning of the eleventh week, and very distinctly in almost every case which I have examined towards the end of the twelfth week. Considerable care, however, is requisite in the use of the stethoscope at this early period of gestation, to enable us to arrive at any satisfactory results.

As this inquiry is limited to the signs of pregnancy during the first three months, it is not necessary to allude to the obstetric auscultation signs of a later period; for these I refer to the excellent treatise of Dr Kennedy.

STATE OF THE URINE IN PREGNANCY.

The only point of inquiry now remaining, is the examination of the changes in the constitution of the urine produced by pregnancy. Although these changes had been quite overlooked by the present race of physicians, till brought prominently before their notice by M. Nauche, in a paper read before the Society of Practical Medicine, in July 1831, it by no means follows that these changes were either unknown or unattended to by our predecessors. The state of the urine in disease attracted no small share of the attention of the medical men of all ages previous to the middle of the last century, and, although they had not the lights of chemistry to guide them to a knowledge of the exact nature of the changes which they observed in that compound fluid, still the attention they paid to the examination of its physical characters well deserves our imitation. Scarcely a disease known to Hippocrates, Avicenna, Galen, Oribasius, Aëtius, &c. was allowed to pass without a notice of the changes produced by it on the urine; and even the urine in pregnancy was not passed over without comment. Nay, so extremely minute and accurate is the description of a few of these writers, that Avicenna's* description of the changes produced by pregnancy on that fluid, might be inserted instead of Nauche's, almost word for word; the only difference being that Nauche has clothed his supposed discovery in the attractive garb of modern chemistry.

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[*] Auscultation appliqé à l'etude de la Grossesse, Paris, 1822.

As I have been unable to procure M. Nauche's original memoir, I am obliged to quote, at second-hand,† his observations on the peculiar matter which he describes as occurring in the urine of the pregnant female. From these it appears that M. Nauche observed that when the urine was allowed to stand for some time, a white flaky pulverulent grumous matter separated and formed a pellicle on the surface, which he considered to be the caseum, or peculiar principle of the milk formed in the breasts during gestation, and to which he applied the name of *Kiestein*. Upon what grounds he rested the assumption of this pulverulent deposit being *caseum* I do not find stated in any work, and so far as I know Mr Pereira,‡ and after him, Dr Kennedy,§ and Mr Kane, have the merit of challenging the accuracy of his observation. But Dr Kennedy and his friend, in correcting, as they imagined, one mistake, seem to have fallen into a more awkward one themselves, in mistaking a phosphatic salt for albumen.

In the year 1839, however, a new impetus was given to further investigation, by the publications of M. Equisier, in the Gazette des Hospitaux, and their republication in L'Experience for

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* Liber Canonis, de Medicinis cordialibus et Cantia, &c. fol. Venetiis, 1555. Lib. iii. fen. xxi. Tract 1, cap. ii. F. p. 385.

† Medico-Chirurgical Review, Vol. xxxi. p. 228. Lancet, Vol. viii. p. 496. L'Experience, Vol. iii. 2d part, p. 61.

‡ Waller's Edition of Denman's Midwifery, p. 171.

§ On Obstetric Auscultation, p. 56.

July, and with notes by M. Tanchon, in the Lancette Française for June.* M. Eguisier described very minutely the changes observed in the pregnant urine, and the peculiar matter to which the term Keistein had been applied. He remarked that the urine passed first in the morning was of a pale colour and slightly milky in appearance; that it reddened litmus, and was not coagulable by heat, nor by the usual reagents of albumen. When allowed to repose, a flocculent cloud, similar in appearance to carded wool, appears in the fluid, and a white flaky precipitate is deposited. After a period, varying from two to six days, little opaque bodies rise from the bottom to the top of the fluid, and at last increase so as to cover the whole surface. It is this substance to which the name Kiestein has been given, and it is so consistent, that, by seizing it by one of its edges, the whole may be with ease removed. It has a white, opaline, somewhat granular look, similar to that of the congealed fat which collects on the surface of soups. In three or four days more the urine becomes turbid, and the pellicle breaks up; small pieces detach themselves from the general mass and fall to the bottom, in which way the whole disappears.

It is stated, that when this pellicle was examined by the microscope, it was found to consist of gelatinous masses of no determinate form; small cubical crystals were also detected in it when it had become stale, but these were not considered as essential parts of the pellicle.

The pellicle occurred in every case of pregnancy examined by M. Eguisier, and he states, that it may be met with from the first month to the end of the full term of pregnancy. He also states, that M. E. Rousseau recognized the same substance in the urine of some gravid females of the lower animals.

Dr Golding Bird† is the only other author, known to me, who has described, from his own observation, this peculiar matter of the pregnant urine. The chief additional information given by him, besides that of his confirming all their observations, was, that earthy phosphates were copiously thrown down from the urine on the addition of alkalies, and that the peculiar opalescent hue of the pellicle was chiefly produced by the presence of fine triangular prismatic crystals of the triple phosphate. These crystals the former authors had described as square, but this was no doubt owing to a hasty examination. The crystals were by both found to be most numerous when the pellicle was stale.

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* Short notices of these may also be seen in the Medico-Chirurgical Review for 1839, p. 228; and in this Journal, Vol. lii. p. 586.

† Guy's Hospital Reports, No. x. p. 15, for April 1840. Observations on the existence of certain elements of the milk in the urine during utero-gestation, and on the application of this fact to the diagnosis of pregnancy.

Dr Bird was unable to speak positively as to the nature of the peculiar animal matter of the pellicle; but he thought it came nearer caseum than anything else, especially when it was considered that a powerful cheese-like odour was occasionally exhaled from the urine during its formation and decomposition.

Such are all the detached observations known to me regarding this substance said to be so peculiar to the urine during pregnancy. Nauche, Eguisier, and Rousseau agree in stating that it exists in every case of pregnancy. Dr Bird, in thirty cases examined, found it awanting in three; but this seemed to depend on peculiarities of the state of the patients at the time, as he appears to have afterwards detected it in their urine after that state was removed.

None of the observers of this peculiar pellicle have, given any better reason for their belief that this matter is caseum than that, at a certain stage of its decomposition, it emits a strong disagreeable odour of decayed cheese.

In the course of a series of experiments I have again and again met with the very same odour from putrid urine, which, excepting in this single particular, had no other character in common. In so far as smell goes, it is impossible to distinguish pregnant from other urine; yet in chemical peculiarities, they have scarcely a single character in common.

The result of my observations regarding the constitution of the urine during pregnancy is, that, in almost every case, at some time or other, the peculiar pellicle may be met with; that it is more apparent in the earlier months than in the last two months; that the relative quantity of the pellicle which is to appear may always be judged of by the quantity of the precipitate which is deposited as the urine cools or stands; and that the quantity of earthy salts in general bear a relative proportion to the amount of the natural sediment, and of the pellicle.

How soon the kiestein appears after conception, I have not been able to ascertain. Eguisier says he has seen it in four cases of pregnancy between the first and the fourth month, and Dr Bird met with it in a woman who supposed herself to be about the end of the second month. I have never had an opportunity of examining the urine of a pregnant female earlier than what was calculated to be six weeks after conception; but at this period it is quite distinct. It is more abundant, and the earthy salts are in greater quantity by the end of the second month; and I think I have never seen either the one or other in greater quantity than during the third month.

Though I have stated that the peculiar pellicle was met with by me in every case of pregnancy, I do not mean to assert that it will in every case at every period be detected. Several exceptions have come under my notice during the last three years, and I had very lately no fewer than two specimens of pregnant urine at the same time, neither of which yielded a pellicle, though kept for eight days, and exhaling a most intolerable odour. I could not account for this in one of the cases, because the urine was in chemical composition precisely the same as other specimens of pregnant urine where the pellicle became apparent. In the other case the urine was found to have temporarily changed its chemical characters. Urine, however, collected from the same patients a few days after, yielded both of them the kiestein pellicle.

The greatest irregularities in the appearance of the pellicle seem to exist in that urine which is secreted during the last two months of gestation. That secreted during the earlier months, not only was found to furnish more uniformly a pellicle, but also in greater abundance than during the later months.

I have examined the urine in many diseases, and especially in those in which a pellicle forms on the surface of the fluid; and I know of no disease in which urine, with the chemical peculiarities about to be detailed, will furnish a pellicle like kiestein.

When the urine of a pregnant woman is allowed to stand some time, it deposits, in almost every instance, a copious sediment of a whitish colour, which, from being of a very light nature, appears floating loosely at the bottom of the vessel with prolonged rugged portions unequally projecting upwards. This peculiar appearance was well compared by Avicenna to shreds of cotton, and Wallæus, Fernelius, Rosinus Lentilus, Rega, &c. describe it as "instar carptæ lanæ." This sediment is much more speedily deposited from the urine of those who are from one to four months pregnant; in them it is usually deposited immediately or a very few hours after cooling. After the fourth month, several hours, in most cases, elapse, before the sediment makes its appearance, and in the later months, I have seen twenty-four hours elapse before any considerable quantity had fallen.

When the sediment has been some hours or days at the bottom of the fluid, in most cases small irregular rounded particles may be observed hanging suspended, yet attached, over its surface; and it is these particles which ascend to the surface, and form the pellicle which has been termed kiestein, which soon breaks up and falls in particles to the bottom of the fluid. This peculiar appearance was also well described by Avicenna "sicut grana ascendentia et descendentia;" and by Wallæus,* as "parvæ particulæ paulo minus quam dimidium Pisi." This sediment appears to be

* Institutiones, Lib. ii. Cap. 6.

much less abundant during the latter months of pregnancy; and in several instances which I have very lately inspected, the sediment which has subsided from the urine, is quite trifling, and contrasts most remarkably with the very abundant precipitate from the urine of women in the third and fourth months of pregnancy. The sediment has also a decidedly redder colour. In this remark the learned Avicenna has likewise forestalled us, for he tells us that, towards the end of pregnancy, the sediment assumes a reddish hue, whereas in the earlier month the hue was glaucous.

The very accurate description of Dr Bird of the peculiar pellicle which forms on the surface, as well as that of Eguisier, which has been noticed above, render any further description of it quite unnecessary.

The urine of the pregnant female then separates into two portions—a sedimentary and a fluid portion. And in the following remarks I shall first state the chemical characters of the sedimentary portion, next of the fluid portion, and, lastly, of the whole urine.

Natural Sediment of Pregnant Urine.—The fluid portion being drawn off, the sediment appears of a dirty-whitish yellow colour, with a fatty granular or grumous look, not unlike some kinds of purulent matter. It is not greasy to the feel, but rather gritty. When suspended in water and boiled, it is wholly dissolved, and forms a clear solution, with a slight urinous tinge, just, in fact, like very pale watery urine. As the fluid cools, nearly the whole is again deposited and subsides to the bottom. If the quantity of water be very great no sediment is deposited on cooling, the whole remains in the state of solution.

The sediment was therefore suspended in water by agitation, and *aqua ammoniæ* added, when the whole was instantly dissolved, leaving the fluid quite clear. When muriatic acid was added to this ammoniacal solution, a copious precipitate instantly appeared, and left the fluid of the same turbid appearance as before the experiment.

To another portion of the sediment suspended in water ammonia was added so as to dissolve it, and then sulphuric acid was added so as to neutralize the ammonia. No precipitate appeared, but, on adding it in excess, very slight turbidity, merely to the extent of slight opalescence, was produced.

When sulphuric acid was added to the sediment suspended in water, the whole was dissolved, faint opalescence, as occurred in the last experiment, only appearing.

Nitric acid added to the sediment suspended in water produced a perfect clear solution.

Muriatic and acetic acids had no apparent effect on the suspended sediment.

Aqua Potassæ dissolved the sediment suspended in water, from which it was again thrown down by muriatic but not by sulphuric acid.

The sediment was dissolved in water by boiling, and whilst still boiling, alcohol was added, that, if albumen or caseum were present, they might be precipitated, but not the slightest change resulted; no precipitate appeared.

Action of Ether on the Sediment.—The sediment, still moist as it was obtained from the urine, was briskly agitated with an equal volume of sulphuric ether. On being allowed to rest, it separated into two parts, the upper or etherial being of a dirty-white colour, and quite opaque, from the quantity of solid particles it held in apparent suspension, the lower watery portion being of a much whiter hue, and the precipitate in it presenting a loose flaky aspect.

When the etherial portion was separated, and allowed to rest for some time, the ether, apparently quite pure, collected on the surface, and a thick gummy-looking fluid subsided. Some of this was poured on writing-paper, but gave no greasy stain. The remainder was therefore boiled, with the addition of a little water when the whole slowly dissolved; and, in proportion as the ether evaporated, and the gummy substance dissolved, a heavy bright-red crystalline sand fell to the bottom of the vessel. In one of the experiments, a few crystals only were formed during the boiling of the fluid, but, on its resting for an hour after, a pretty tolerable quantity of bright-red crystals were obtained. (Plate VI. Figs. 10 and 11). On cooling, the fluid assumed quite a milky hue from the appearance of a copious white precipitate, and, when a portion of this was poured on glass, it presented much the same appearance as a drop of watery milk would have done.

When *aqua ammoniæ* was added to this fluid with its sediment suspended by agitation, the whole was dissolved, and the fluid became clear and transparent, and the subsequent addition of muriatic acid only caused a slight opalescent hue, and, on being allowed to stand for a few minutes, a distinct but trifling precipitate appeared, which was removable by boiling the fluid.

The addition of *aqua potassæ* to the fluid, with its sediment suspended, also produced solution, and sulphuric acid subsequently added caused slight opalescence, also removed by boiling.

Nitric acid added to the fluid and suspended sediment caused its complete solution.

Muriatic acid caused scarcely any change at first, but slowly produced solution of the sediment, and after a while left the fluid nearly but not quite clear and transparent.

Sulphuric acid caused at first scarcely any change in the appearance of the fluid. After a while however the sediment became dissolved, but the fluid still retained a light opaque hue.

Though such was the general result of the chemical examination of the etherial portion of the sediment, on more than one occasion in which a more copious deposit than usual of the red crystalline particles had occurred, I was unable to procure marks of any reaction with either acids or alkalis on the fluid which remained; but in these cases, no white flaky deposit or sediment ever occurred on the fluid cooling after being boiled with water. The whole of the dissolved gummy-looking matter seemed to be resolved into the red crystalline-looking particles. This was only remarked when the sediment had remained above 24 hours covered by the urine before being examined.

When the lowest watery portion was minutely examined, a few large bright-red crystalline particles were observed at the bottom of the vessel; and when the fluid was boiled, in proportion as the ether in union with it was expelled, and the sediment was dissolved, more of these heavy bright-red crystalline particles fell to the bottom. Whilst hot, the fluid was of a pale colour, just like watery urine, and quite clear and transparent, but as it cooled, the white flaky precipitate again made its appearance, imparting to the fluid quite a milky appearance.

To some of this solution, when warm, ammonia was added; but no change apparently resulted; a precipitate appeared however on cooling.

The following experiments were therefore made with this fluid cold, the sedimentary deposit being merely suspended in it by agitation.

To some of this fluid, then, ammonia was added, when it instantly caused the whole of the suspended sediment to be dissolved, and left the fluid perfectly clear; but, on being allowed to rest for a few seconds, a copious flocculent precipitate made its appearance, which was not soluble in the fluid when brought to the boiling point. This showed that the precipitate which the ammonia had thrown down was of a perfectly different nature from that which it had dissolved; for that which it had dissolved was soluble in the fluid when boiling, but this which it had caused to be precipitated was insoluble in the boiling fluid.

When muriatic acid was added to the fluid in which was the precipitate thrown down by the ammonia, the whole was dissolved with the copious evolution of white fumes, and the fluid was left quite clear.

The same occurred when nitric acid was added, the white fumes being evolved in nearly equal quantity. Sulphuric and acetic acids also dissolved the ammoniacal precipitate, but the white fumes were just distinctly apparent, and no more.

To some of the same fluid, with its precipitate suspended, sulphuric acid was added; but no change ensued. When, however, ammonia was afterwards added, the whole became dissolved; but on standing a little, another precipitate appeared, which was not soluble in the fluid when boiling.

Precisely the same occurred when muriatic or nitric acids were used.

When the fluid was in a state of greater dilution, or from some other cause, nitric and acetic acids dissolved the suspended precipitate; and sulphuric and muriatic acids partially dissolved the same, leaving only slight opalescent turbidity.

A portion of the natural sediment was exposed to a red heat on a plate of mica, when it gave off a strong ammoniacal odour, and became converted into a blackish-coloured hard ash.

Such, then, seem the chemical characters of the natural sediment of the urine of the pregnant female. It was soluble in water by the aid of heat, and soluble when cold by ammonia, sulphuric and nitric acids, but was insoluble in muriatic and acetic acids.

The chemical peculiarities of the urine freed from its sediment come next to be noticed.

Urine freed from its Sediment.—When the fluid is heated to the boiling point and alcohol added, no change occurs.

When ammonia is added to the urine freed from its sediment, a copious deposit takes place, which is soluble in muriatic and nitric acids with the evolution of copious white fumes, which fill the vessel in which the experiment is conducted; and is also soluble in sulphuric and acetic acids, but without any evolution of fumes.

No precipitation is caused, nor any apparent effect produced by the addition of either muriatic, acetic, nitric, or sulphuric acids. But if this portion of the urine be slightly acidulated with nitric acid, and oxalate of ammonia be added, a precipitate is thrown down.

When to this portion of the urine a solution of corrosive sublimate is added, a copious precipitation ensues, which is extremely soluble both in nitric and muriatic acids. This precipitate Dr Kennedy seems to have mistaken for albumen, and hence asserted that that animal substance always existed in the urine of the pregnant female.* Corrosive sublimate, it may be remarked, is not the best test for the presence of albumen in such a compound fluid as the urine, for both phosphates and lithates strike a precipitate with it.

When a portion of this urine was evaporated to dryness, and water poured over it in small quantity to dissolve the soluble matters, a deep-coloured fluid was obtained, which, on the addition of a drop of nitric acid, became converted into a solid mass of the scaly crystals of the nitrate of urea.

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* Obstetric Auscultation, p. 57.

Having thus noticed the chemical characters of the two portions into which the urine of the pregnant female naturally separates itself, it only now remains to describe those of the urine taken as a whole.

Entire Urine of the Pregnant Female.—The urine when passed is usually faintly acid; apparently from the presence of lactic acid.

When the urine is heated the sediment is dissolved, but no turbidity is caused by raising the heat to the boiling point. As the urine cools the sediment is again deposited apparently unchanged.

When *aqua ammoniæ* was added to the cold urine with its sediment suspended by agitation, the whole was dissolved, but in a second or two after, turbidity was again observable, which gradually increased, till a copious curdy or flaky precipitate made its appearance. This precipitate was not soluble in the fluid when raised to the boiling point, but was soluble in muriatic, sulphuric, nitric, and acetic acids. On the addition of muriatic and nitric acids, copious white fumes were evolved, filling the vessel in which the experiment was made; but were only feebly evolved on the addition of the sulphuric and acetic acids. The solutions resulting were very transparent when the nitric, muriatic, and acetic acids were used, but acquired a slight opalescent hue on standing, when sulphuric acid was employed to dissolve the ammoniacal precipitate.

When *aqua potassæ* was dropped into the urine with its sediment suspended by agitation, the fluid first became clear, and afterwards a precipitate appeared as in the last experiment, which was equally dissolved by sulphuric, acetic, muriatic, and nitric acids.

When sulphuric acid was added to the urine with its sediment, the whole was dissolved; and the same happened when nitric acid was used. But muriatic and acetic acids had no apparent effect on the sediment; the urine after their addition remained turbid as before. When the whole urine was treated by ether in the same way the sediment had been, the etherial solution had the same appearance, and gave the same result.

These experiments clearly showed that the natural sediment of the urine was very different from that which appeared on the addition of an alkali; the natural sediment being soluble in the fluid when heated, and also in alkalies, but not in muriatic or acetic acids; whilst the latter precipitate was insoluble in the hot fluid, and was yet soluble in muriatic and acetic acids, the very agents which had a quite opposite action on the natural sediment.

To ascertain the presence of albumen or caseum, some of the whole urine was boiled, and whilst still hot alcohol was added, but no change took place. To another portion similarly heated acetic acid was added, but equally without indicating the presence of any of these ingredients.

The chief sediments which are deposited from the urine, or occur as calculous deposits, are those of uric acid, urate of ammonia, oxalate of lime, phosphate of lime, ammonia-magnesian phosphate, carbonate of lime, cystic oxide, and xanthic oxide. To which of all these can the natural sediment of the pregnant urine be referred?

It cannot be uric acid, for any acid precipitates it from an alkaline solution,—whereas this natural sediment, though taken up by alkalies, is not precipitable by sulphuric acid; besides being soluble in acids, which uric acid is not.

It cannot be the urate of ammonia for precisely the same reasons.

It is not the oxalate of lime, for nitric acid, which has no action on the oxalate, instantly dissolves the sediment.

It cannot be the phosphate of lime, for muriatic acid, which dissolves the phosphate, has no action on the natural sediment.

It is not the ammonia-magnesian phosphate, for all acids dissolve that salt, whereas the muriatic and acetic acids have no apparent action on the natural sediment.

It is not carbonate of lime, for muriatic acid, which dissolves the carbonate freely, has no action on the sediment; and alkalies which have no action on the carbonate dissolve the sediment.

It cannot be the cystic oxide, for all acids dissolve that substance, whereas muriatic and acetic acids have no action on this.

And for the very same reason it cannot be the xanthic oxide.

If the sedimentary deposit from the urine of the pregnant female is not, and cannot be any of the substances recognized as the usual constituents of deposits from urine, the next object of inquiry is, to discover what it is, and what is its nature.

It was to enable me to separate this matter more completely from the other ingredients of the urine, that I first thought of using ether, as it was possible that this substance, which did not agree in chemical characters with any of the usual urinary sediments, might be an animalized matter. The consequent result of using the ether was what I had anticipated. It separated this matter from all the other ingredients of the urine, when the dissimilarity of the characters from any substance previously known to me strongly impressed my mind.

As the urine of pregnancy, however, gives out a putrid or strong odour, which more than one author has compared to decaying cheese, I thought upon trying the effect of mixing urine, whose chemical characters were known, with a certain proportion of milk, and then to ascertain whether, on chemical analysis, the same results were obtained as from the examination of the pregnant urine.

My first experiment on such a mixture was made by mixing milk, drop by drop, with urine, on which no acid or alkali produced any sensible precipitate, till the mixed fluid had assumed the hue of pregnant urine with its sediment suspended by agitation. To appearance it was then precisely similar, and might easily have been mistaken for it.

On boiling some of this milky urine no change occurred, nor did the addition of alcohol to it when boiling produce any precipitate. Nitric acid produced a precipitate not affected by heating the fluid gently, but partially dissolved by boiling. This probably arose from the particles of the precipitate being more firmly agglomerated by the heat. *Aqua potassæ* added to this fluid whilst still hot produced no change.

When acetic acid was added to some of the milky urine, no very apparent change took place, though, on examining the fluid by transmitted light, small flocculent particles were distinctly seen floating through the fluid. No further change was produced by boiling the fluid. As it cooled, the precipitate became much more distinct.

Muriatic acid, when added to the milky urine cold, produced no apparent change, but on boiling it, a minute curdy precipitate was thrown down.

Sulphuric acid produced the same small-particled precipitate as muriatic acid, and after the fluid was shaken briskly, it separated as curdy flakes, and floated at the surface. Potash being added to this produced no change.

Ammonia caused no change on the appearance of the milky urine, not even when boiled.

This experiment was several times repeated with varied quantities of milk. When the milk was added in very small proportion no reagent produced any change.

I next mixed some milk with pregnant urine, from which the sediment was removed; as the latter apparently contained the whole, or nearly the whole, of the peculiar matter the nature of which I was anxious to find out.

Boiling produced no change on this milky pregnant urine.

Ammonia removed for an instant, but not completely, the greater portion of the turbidity, but immediately after caused the deposition of a copious flocculent precipitate, which was dissolved on the addition of sulphuric acid, but was immediately thereafter followed by the production of a flocculent precipitate, which rose to the surface of the fluid, leaving the fluid below quite clear. This last precipitate was not soluble in ammonia.

Potash had in every respect the same action on the milky pregnant urine.

Nitric, sulphuric, muriatic, and acetic acids, produced a copious flaky precipitate, which was not soluble in ammonia; but the addition of ammonia in excess caused the subsidence of an additional precipitate.

This experiment was often repeated, and always with the same result; only that, when the quantity of milk was very trifling, none of the reagents had any effect on it.

Thus it appears that the caseum of the milk when suspended in water is capable of being detected by acids, which produce coagulation, but is not affected by alkalies.

I now treated with ether the urine which I had mixed with milk, in the same way as I treated the pregnant urine itself; and found that the ether removed the whole of the animalized matter, or caseum of the milk from the urine, in the same way as it had done the peculiar matter of the pregnant urine.

The etherial solution of the two could not be distinguished the one from the other. The etherial solution of the milky urine was viscid, opaque, of a gummy look, and when heated first became somewhat clearer, but as the ether evaporated, and the heat rose, the fluid became more opaque from the formation of a white flocculent precipitate. No red crystals appeared, as occurred in the animalized matter of the pregnant urine.

When this etherial portion cooled, the precipitate, which had fallen, gave to the fluid a turbid appearance; and when ammonia was added, the fluid became somewhat clearer, from part of the precipitate being dissolved, and then there fell a fresh precipitate, which was removed by nitric acid, leaving the fluid of its original turbidity.

Sulphuric acid caused an increased turbidity in the etherial portion of the fluid from the production of a fresh precipitate, which was removed by ammonia, when only added to saturation of the acid, leaving the fluid of its former turbidity.

Chemical agents being thus unable to determine the exact constitution of the natural sediment, I had recourse to the aids of microscopic examination.

My experiments had taught me that the peculiar matter of the urine might be removed from the other ingredients by shaking a portion of the urine or its sediment with an equal portion of ether. This plan I therefore at first adopted. The etherial solution was made, a small portion of it spread over glass, and examined by the microscope.

Upwards of sixty specimens of pregnant urine have been examined in this way, and in all of them globules somewhat similar to those of the milk were distinctly perceived. The whole etherial portion, in fact, seemed to be composed of globules floating in a viscid gummy-looking fluid, which was quite transparent. The globules, on the other hand, had a whitish hue, and when the light was thrown on their sides, the opalescent light which was reflected rendered them very easy of detection. These globules in every case were perfectly circular, and their colouring matter appeared to reside in their external envelope, as, by transmitted light, the globules appeared transparent in their centre, with a faint opalescent hue on their circumference.

These globules were dispersed over the glass in various groups, according as the layer of matter had been laid on thicker or thinner. Where the layer was thin, the globules were disposed singly for the most part, as in Plate VI. Fig. 1. Occasionally here and there, three or more globules lay in close contact, or were disposed in the form of round little globular bodies, but these could easily be seen to be formed of congeries of the very same minute globules, as in Fig. 2.

Where the layer of matter was thicker, the globules were disposed in very irregularly formed groups, all distinctly made up of the same minute globules,—the interstices between these groups being filled up with extremely numerous single globules, as in Fig. 3.

From the globules being so very numerous and distinct when removed from the rest of the urine by means of the ether, I was induced to examine the sedimentary portion dried on glass. I found it, when recent, to be composed entirely of globules, in no respect differing, either in their general appearance or mode of grouping, from those represented in Fig. 3. When, however, the sediment was allowed to rest a day at the bottom of the urine before being removed for examination, they usually assumed, when laid in a very thin layer over the glass, the appearance of angular lines, or masses connected with angular lines, the interspaces being also filled up with single globules. This appearance is represented at Fig. 4.

The entire urine, before it had deposited its sediment, was the next object of examination, lest it might be supposed that the appearances described were the result of chemical changes. Every specimen of pregnant urine I have examined has contained the very same globules in greater or lesser abundance, according to the period of pregnancy. The most part of the globules float singly, but here and there they are formed into clusters of two, three, or more, and are occasionally agglomerated into little irregular masses, the globules composing which are quite distinct, and of equal size, Fig. 5. They are also very evidently more transparent than when they are seen in the natural sediment, and bear a much stronger resemblance to the globules of albumen, as seen in albuminous urine. Fig. 6.

The entire urine, with its deposited sediment suspended by agitation, was also examined by the microscope, and found to consist of globules in no respect differing in appearance from those existing in the fresh still clear urine, excepting that the globules had assumed a more opalescent hue, in this respect approaching more nearly the appearance of the true milk globule. They were observed grouped in all the varied forms represented in Figures 1, 2, and 3.

In order that these may be compared with the true milk globule, or globule of caseum, Fig. 7 represents the milk globule, which, to appearance, differs in no respect from the globule of the sediment of pregnant urine, either when it has been deposited naturally or removed by means of ether. The milk globule, however, as it exists naturally in the milk, is much more opaque than the globule of the sediment of pregnant urine before it is deposited as a sediment. The milk globule, after it has been coagulated by means of acetic acid added to boiling milk, is represented at Fig. 8, where it will be seen that, although the properties of the caseum be changed, the form of the globule is not. After the coagulation, however, the globules are apparently still more opaque. In this respect, the milk globule bears a similarity in its minute changes to the peculiar globule of the pregnant urine. Both, when precipitated from their solutions, become more opaque.

When milk, deprived of its oily parts, is agitated with ether, nearly the whole of the globules of caseum are removed, and when spread on glass and examined by the microscope, they present in every respect the same appearance as those represented in Fig. 8.

The etherial solution obtained from the urine which had milk added to it, likewise exhibited the milk globule unchanged, and is represented at Fig. 9, the globules being disposed singly or in irregular groups and masses over the glass.

Such is the appearance of the sedimentary portion of the urine of the pregnant female when examined in the recent state, either whilst it is still held in solution in the urine, deposited as a sediment, or separated by means of ether. In all these states it is composed of distinct transparent or pellucid globules, which in their pellucid state bear a striking resemblance to the serous globule; but when in the sedimentary state, an equally strong likeness to the milk globule in recent milk.

The question, then, as to the precise nature of this substance, is limited to very narrow bounds. It is quite apparent, from its chemical properties, as well as its minute structure, that it differs essentially both from albumen and caseum, the two most analogous substances existing in animal structures. From albumen it differs in being soluble in water by means of heat, which coagulates albumen, and from caseum, by being rendered soluble by sulphuric and nitric acids, which have a solidifying action on caseum. The only other analogous principle in animal structures, and one which is regarded as only a modification of albumen and caseum, is fibrin, from which it differs still more than from those above noticed.

There is another substance, however, occurring in animal structures, the characters of which it will be necessary to notice before drawing any conclusions as to the nature of this one, viz. Gelatine.

The characteristic marks of gelatine are, that it is soluble in boiling water, with which, on cooling, it forms a tremulous jelly. It is soluble in acids and alkalies, and is precipitated from its solution in water by means of tannin.

When a drop of its watery solution is examined by the microscope, it also presents the appearance of distinct transparent round globules, of the size of the milk globule. See Fig. 15. When ether is agitated with its watery solution, it also removes the gelatine as it did the caseum, albumen, and the peculiar matter of the urine; and on examining this by the microscope, the globules are seen to be unchanged in appearance.

Gelatine then resembles the peculiar matter of the urine of the pregnant female in so far as it is composed of similarly formed globules, is soluble in acids and alkalies, and in water with the aid of heat. The peculiar matter of the urine was therefore tested with solution of tannin, to ascertain whether any difference existed, in this respect, between them.

Some of the natural sediment was collected, still moistened with the urine, from which it was obtained, and decoction of nut-galls added to it, after it had been dissolved in water by boiling, and cooled down to blood-heat. A slight flocculent precipitate was occasioned, which rose to the surface of the fluid. When this was agitated with the fluid and boiled, the whole dissolved, leaving the fluid quite clear.

Here, then, were two especial distinctions, by which the peculiar substance referred to seems to be separated from gelatine; *first*, it was precipitated from its solution in water as it cooled, and, *secondly*, though a partial precipitation was occasioned by tannin, the precipitate was soluble in water on boiling it. The precipitation of gelatine by tannin is only rendered more solid, and more easily separable from the fluid, by boiling.

The conclusion, then, at which I arrived, was, that *this substance is a matter sui generis; an elementary substance or principle, forming, in some measure, a connecting link between the albuminous and gelatinous elementary principles.* I therefore propose to designate it by the name of GRAVIDINE, from *gravidus*, big with young, as occurring during the state of pregnancy, and having had its nature first pointed out from examining the urine during that state; and also from *gravis*, heavy, denoting its precipitation, and falling down to the bottom of the vessel, as the fluid containing it cools.

The term kiestein I still use to express the pellicle which results from the decomposition of this peculiar animal matter.

M. Vogel, in a very instructive paper on animal chemistry,* states, that "these three substances, albumen, fibrine, and caseum, present many points of resemblance in their properties. All can exist in two states, dissolved or coagulated, with this difference only, that fibrine coagulates of itself, on being removed from the living animal body; that caseum is so by some unknown process on the addition of rennet; and that the coagulation of albumen is especially produced by heat."

This discovery of a new elementary animal substance, for such I may term it, adds then a fourth to the substances which exist in two states. It is in its fluid state in the urine when still hot, and in its solid or coagulated state when deposited naturally on cooling, or when precipitated from an alkaline solution, by means of muriatic acid. Indeed, very nearly the same remark as to these animal principles, being capable of existing in two states, is applicable to gelatine, and perhaps all elementary animal principles.

It is from the decomposition of the globules which exist in the urine of the pregnant female that those changes result which terminate in the formation of the pellicle of kiestein. In proportion as the globules become decomposed, urates and purpurates become developed in the urine; and when the greater portion of these have broken up and have assumed new combinations, the triple phosphate makes its appearance, and then we have the beautiful crystalline appearance, so well described by Dr Bird, as being one of the characteristics of the pellicle of kiestein.

The globules of gravidine, however, pass through several changes before they arrive at that stage in which the triple phosphate becomes the leading or chief ingredient.

When the natural sediment was treated by ether, after having lain three or four days in winter, or two days in summer, at the bottom of the urine, and the etherial portion boiled with a little water, a heavy, red, copious, crystalline sediment fell to the bottom of the fluid, which, on being examined by the microscope, exhibited distinct cubical crystals of a deep-brown colour, by transmitted light, evidently crystals of lithic or purpuric acid, or compounds with ammonia, Fig. 10, *a*. In other instances, the crystals assumed various forms of the rhomboid, as represented at Fig. 11, but still were all of the deep reddish purple or brown colour. A few globules of a large size and oval shape, with a clear centre and coloured circumference, were also observed, the nature of which I have not yet determined.

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* Journal de Pharmacie for 1830, p. 590.

The watery portion of the same sediment which had been treated with the ether, and then boiled, also deposited a considerable quantity of bright red crystalline-looking sand, which on examination proved to consist of crystals of various forms, those of the different forms of the cube, rhomboid, and rhomboidal prism being much the most numerous. A few colourless triangular prisms of the triple phosphate were also quite distinct; a very few of the flat octohedrons, represented by Wollaston, as that which the oxalate of lime most frequently assumes; and one or two whose exact nature I could not even guess at. Several small globules were seen scattered over the surface; and in groups or single, large dark-margined oval globules with clear centres. The cubes, rhomboids, and rhomboidal prisms were all of the same deep brown or reddish purple as those above noticed, and were evidently either lithic or purpuric acid, or some of their compounds. All these forms are represented at Fig. 12.

In one of the processes employed, crystals resembling cystic oxide were produced in considerable quantity. A portion of urine, from which the greater portion, but not the whole, of the sediment had been removed, was evaporated to dryness by a very gentle heat; but towards the end of the process the heat was increased so as to drive off every remaining portion of moisture; water was then added, and heat again applied; and on removing some of this fluid, and examining it with the microscope, numerous beautiful large, more or less regular transparent six-sided crystals of cystic oxide were obtained. In many cases the crystals were of excessive tenuity, resembling six-sided plates. See Fig. 10, *b*.

When the pellicle of kiestein has fallen to the bottom of the vessel, and the whole urine is exhaling a most intolerable odour, scarcely any crystal is observed, but the colourless triangular ones of the triple phosphate, and the globules are evidently much diminished in number. It appears, indeed, that all the chief changes which result from the decomposition of urine result from the breaking up of these globules, and the elementary parts which compose them entering into new combinations.

This was most beautifully illustrated in a specimen of urine obtained the 16th of November, from a patient in the Royal Infirmary, who had a miscarriage 48 hours before. The urine when first passed possessed all the characters of that which occurs during the course of pregnancy, and one more—it was filled to saturation almost with urea. When a drop of the urine was dried on glass the long crystals of urea were seen crossing it in all directions. See Fig. 13. The very next day, however, I observed that the copious sediment which had been deposited on cooling had become almost entirely dissolved; that the fluid of the urine had become much deeper in colour; and that when a drop was allowed to dry on glass, and was examined by the microscope, the urea had almost entirely disappeared, the globules were much less numerous, and, in place of the urea, there were numerous cubic and rhombic crystals of the lithic or uric acid. See Fig. 14.

As to the probable mode of formation of this peculiar matter in the urine during pregnancy, I am not prepared to give any opinion. Ever since the publication of the memoir of M. Nauche it has been regarded as a variety of caseum, and described as milk in the urine. Theory then found it easy to suppose that milk had been secreted in the breasts, but not having an outlet there was again taken up and thrown out of the system by the kidneys. As the matter, however, is neither milk nor caseum, but a peculiar and distinct substance, this explanation will not serve; and even Dr Golding Bird, though holding the milk theory, has mentioned several circumstances which seem subversive of it.

Such, then, are the facts which I have observed to be characteristic of the existence of pregnancy during the first three months of gestation; and, though somewhat contrary to the general belief, I am inclined to think, that, by due attention to them, a certain opinion may be given, if not by the end of the second, certainly by the middle of the third lunar month, that is, the end of the tenth week. At this period all the symptoms characteristic of pregnancy are present, and when the combination of the areola, enlarged uterus, placentar souffle, and gravidine in the urine, occur, no doubt can remain as to the existence of a fœtus in utero. In many cases these signs, when carefully attended to and well marked, will enable the observant physician to form a decided opinion by the end of the sixth week; but it is extremely rare, indeed, that any one is asked to give a decided opinion at such an early period. In a medico-legal case again, where we are required to give evidence on oath, unless the other signs were from their combination quite conclusive, it would be better to wait till the end of the tenth week, by which time the enlarged uterus and the presence of the placentar souffle would put the case beyond doubt.

Explanation of Plate VI.

Fig 1. Globules of gravidine removed from the natural sediment by means of ether.

Fig. 2. One of the forms of aggregation assumed by the globules of gravidine when dried on glass.

Fig. 3. The most common form of aggregation of the globules of gravidine, as seen in the natural sediment, or when separated by ether.

Fig. 4. Appearance which the globules of gravidine frequently assume when the natural sediment has been dried on glass.—Dr Prout, in his work on Urinary Diseases, represents globules assuming somewhat of this form as oxalate of lime.

Fig. 5. Gravidine globules as seen in the urine whilst still recent.

Fig. 6, *a*. Globules of albumen as seen in albuminous urine whilst in a fluid state. *b*. Ditto dried on glass; represented by Dr Prout as one of the forms which the triple phosphate assumes.

Fig. 7. Globules of caseum, as seen in milk after the cream has been removed.

Fig. 8. Globules of caseum after the milk has been coagulated by means of acetic acid.

Fig. 9. Globules of caseum removed by means of ether from urine with which milk had been mixed.

Fig. 10, *a*. Red coloured cubical crystals of lithic or purpuric acid deposited from the boiling solution of gravidine in ether.

b. Six-sided transparent crystals obtained from the watery extract of pregnant urine after the greater portion of the sediment had been removed. From their form and transparency they bear a strong resemblance to crystals of cystic oxide.

Fig. 11. Forms of the cubic and rhomboidal prisms deposited from the etherial solution of gravidine when boiled. Probably lithic or purpuric acids or their compounds.

Fig. 12. Crystals of various forms deposited from the etherial solution of gravidine which had become partially decomposed from remaining some days in contact with the urine. The triangular prisms appear to be the triple phosphate; the flat octohedron is supposed to consist of the oxalate of lime, that being the form commonly assigned to that salt. The others, which were of a clear but deep brown by transmitted light, but of a deep red by reflected light, appear to be either lithic or purpuric acid, or their compounds.

Fig. 13. Crystals of urea, and globules of gravidine seen in the urine of a woman who had a miscarriage 48 hours before.

Fig. 14. Cubic and rhomboidal crystals of lithic acid, replacing the greater portion of the urea and globules in the same urine after it had stood in a warm apartment for 24 hours.

Fig. 15. Globules of gelatine as seen in the jelly of isinglass, recent, or dried on glass.

PART II.

CRITICAL ANALYSIS.

ART. I.—1. *Practical Observations on various subjects relating to Midwifery.* By JAMES HAMILTON, M. D., F. R. S. E., Professor of Medicine and Midwifery in the University of Edinburgh. Second edition, revised and enlarged. Edinburgh, 1840. 8vo, Pp. 425.

2. *Elements of Obstetric Medicine, with the Description and Treatment of some of the principal Diseases of Children.* By DAVID D. DAVIS, M. D., M. R. S. L., Professor of Obstetric Medicine in University College, and one of the Physicians to University College Hospital. Second edition, illustrated by Engravings on Wood. London, 1841. 8vo. Pp. 1002.

THE recent publications on Midwifery may be distinguished into two classes. The one class consists of those works in which the principles of the subject are expounded; the other embraces those in which its practical applications are detailed. Amongst works of the former kind, may be mentioned those of Gardien, Capuron, Velpeau, Moreau, in France; of Carus, Kilian, Siebold, &c. in Germany; and of Denman, Burns, Davis, and Rigby, in this country. Of the whole of these works, that of Dr Denman appears, even at the end of from forty to fifty years, to be upon the whole by far the most valuable, whether we regard its methodical clearness of arrangement, the unaffected simplicity of its style, or the remarkable combination of science and judgment which appears in all his practical precepts.

Of the latter class we have a few continental works: but amongst others of all countries may be mentioned, those of Dugés, Joerg, Burns, Conquest, Ramsbotham, Maunsel, Collins, Hamilton, &c. To these must be added several valuable monographs, published either separtely or in some of the periodical works of the day, by Dr Lee, Dr Ingleby, Dr Radford, Dr Churchill, and other writers too numerous to be here mentioned.

The Elements of Dr Davis belong to the first class of publications; the Observations of Dr Hamiton fall under the second.

The object of the late Dr Hamilton's work is stated in the advertisement to his first edition to be, " to record those deviations from the established modes of practice in several ordinary affections of women, which the experience of nearly half a century has led him to adopt and recommend."

Dr Hamilton's name as a zealous teacher and successful practitioner of obstetric medicine is known and appreciated wherever the science is cultivated. His having been Professor of that branch in the University of Edinburgh, and the first practitioner in that city for nearly half a century, has rendered his work at once one of high authority and deserved reputation.

The changes which took place in his second edition were mainly attributable to those qualities of mind by which he was distinguished. He was firmly and conscientiously convinced of the truth of his doctrines; he was very confident in maintaining their accuracy against all by whom they were controverted; he had a large share of professional zeal, which continued in its pristine fervour to the advanced age of seventy-three; he was not very tolerant of difference of opinion, much less of contradiction; and he was extremely active and industrious in promulgating and defending what he conceived to be good practice, and denouncing and exposing that which he felt to be bad. At the time when he was attacked by the disease which terminated his useful and active life, he was engaged in revising the sheets of the edition before us; and the work, therefore, is bequeathed to the profession under those solemn and impressive circumstances which are calculated to render it the death-bed legacy of one whose long experience well qualified him to be a useful and skilful instructor.

The work of Dr Davis commences with a description of the pelvis; the framework, to which are attached almost all the organs which properly come under discussion in works of the present kind. He has given an excellent description of the dimensions and distinctions of the male and female pelvis, the deviations from the best forms of pelvis, as well as the different varieties of deformed pelvis.

As a specimen of the author's writing on this subject, we quote the following passage: "A pelvis may be too small absolutely or relatively. The pelvis of a very small woman may be too small for the purposes of parturition, under any circumstances; or it may be too small only in the event of its subject becoming connected by marriage to a gigantic husband. A pelvis may be too small, and yet its several parts may be duly proportional among themselves. We, moreover, occasionally meet with examples of defective capacity of the pelvis, when other parts of the skeleton are of standard magnitude, which may arise from original conformation, or be the consequence of a diseased condition of the osseous system in early life."

It is rather an objection, however, to the work, that, in treating of the different varieties of deformed pelvis, Dr Davis does not follow the distinctions and divisions of Professor Naegele, which are now so generally adopted by the profession. Many of the standard varieties which Naegele has pointed out are in consequence, omitted to be mentioned. The observations on this subject in Dr Hamilton's work are entirely confined to cases which have come more immediately under his own inspection. The outline drawings, however, which accompany the work, give beautiful illustrations of almost every variety of deformed pelvis.

The use of pelvimeters in this country seems now to be entirely confined to the obstetric class-room; for the belief seems very general, that, however well they may be suited for exhibiting, as used on the dried pelvis, before a class of students, they are of little use, or little to be depended on, in practice. Both authors agree regarding their use; and the general opinion may be understood from the following expressed by Professor Davis. " In this country artificial pelvimeters have been very seldom used, and perhaps never exclusively depended upon; whilst, indeed, there is not one diameter, nor any portion of the cavity of the pelvis, which cannot be much more accurately ascertained by the natural pelvimeter, the practitioner's hand, than by any artificial means whatever."

In Professor Davis's second chapter, on " the structure and diseases of the external genitals," a great variety of subjects are brought under discussion.

In describing the *mons Veneris*, he makes mention of the particular form of pediculus to which it is liable, and which produces such distressing pruritus. " The proper treatment," says he, "consists in an application to the part affected, of an ointment made with red or white precipitate and common cerate or pomatum, in the proportion of a drachm of the former to an ounce of the latter, alternately, with daily ablutions with soap and warm water." This is certainly a much cleanlier application than the blue ointment, which was, and is still in common use; but we think that shaving the hair, and the use of a lotion of corrosive sublimate, used twice a day, are still more cleanly, and equally if not more effectual than either.

A section of the present chapter is devoted to the consideration of that peculiar elongation of the external genitals which is commonly known under the name of the Hottentot apron. It seems still to be a matter of doubt whence this elevation originates, whether from the *labia majora*, as M. Vaillant, Barrow, and Professor Moreau de la Sarthe think; of the nymphæ, as Captain Cook, Dr Somerville, and most voyagers have considered it; or a fold of the abdominal integument, as it has been considered by others. Péron and Lesueur submitted to the French Institute, in the year 1805, two memoirs on this singular production, from which, and the late researches of M. de Janssens, instituted during a three weeks residence in the country, it is now satisfactorily ascertained that it is never to be seen amongst Hottentot women; that it is characteristic of a numerous nation known under the name of the Houzouânas or Boschemans; and that the constituent structure of the superadded part consists of a fleshy substance, covered with a brownish integument. "It takes its origin from the superior commissure of the *labia majora.* From this source it becomes gradually developed in width, and, after dividing itself at no great distance from its origin, it descends in two pendulous lapels of a triangular figure, so as to form the pudendal apron, now pretty satisfactorily proved to be a characteristic distinction of the Boscheman female." For further particulars on this subject, and the other affections of these parts, we refer to the work itself, which contains much that is interesting and practical.

In this chapter, also, we find some valuable observations on retention of urine, on growths from the mucous membrane of the mouth of the urethra, for which he recommends properly adapted pressure,—and on inversion of the female urethra, all which are well deserving the careful attention of the practitioner, as they are extremely perplexing when met with in practice.

In this chapter, too, we find the subject of stone in the bladder of the female discussed. We think it would have been more consistent had it been placed in the next chapter, under the head of affections of the internal organs. This circumstance, extremely trifling in itself, we would not have thought worth mentioning, had it not been that there are several such misplacements in the book, some of which look rather odd. We find under this head, however, a very good summary of the cases of stone in the bladder which have been published, arising from the introduction of foreign bodies into its cavity; and Dr Davis thus expresses himself regarding all cases of stone in the female, and the operations necessary for their removal. "It may be here added, in objection to this practice of surrendering cases of stone in the bladder, even in females, to the unassisted powers of nature, that the retention of calculous bodies within its cavity, for many years, has not unfrequently been succeeded by distressing and fatal ulcerations, even of that organ itself. It is, indeed, true that the ordinary operation of cutting for the stone, when performed upon the female, has, in too many cases, been followed by fistulous openings, between the neck of the bladder and the vagina, which have never healed. It is also too true when the high operation, even from choice or necessity, has been preferred, that it likewise has been succeeded in numerous instances by inconvenient, and even disastrous results. But the practitioners of the nineteenth century have the happiness of contemplating, in the beautiful operation of lithotriture, a remedy so easy of application, especially in the female, and so sovereign in its results, that the most timid subjects of this disease will in future be left without a reasonable excuse for the surrender of their happiness, and sometimes of their lives, to the uncertain issues of lithotomy."

Dr Davis does not make mention, when on this subject, of a practice which has been long a favourite with Scottish surgeons in cases where the calculus is not very large, viz. that of dilating the urethra to such an extent as to render its extraction a matter of great ease. The female urethra is very readily dilated by means of sponge-tent to a considerable degree, and the extraction of a moderate sized stone is thus rendered an operation of comparative facility.

Passing over a valuable chapter on diseases of the internal organs of generation, into the consideration of which our space will not admit of us entering, we come to one on the structure, functions, and uses of the unimpregnated uterus. Here we find a full account of the subject of menstruation, of the age at which it appears in different nations, the usual quantity of the discharge, its duration, irregularities, analogies, &c. In noticing the final cause of menstruation, the author mentions his belief in its being exclusively confined to the human female. The females of the lower animals have a discharge from the vagina in small quantity during the period of oestrum, or heat, as it is more commonly called, and during which time alone impregnation will take place. The similarity between this period and that of menstruation in the human female is allowed by our author, its first appearance denoting the period of puberty, its cessation marking that of old age, its absence during pregnancy and lactation, all sufficiently point out the similarity of the function in the two classes of animals.

Dr Davis supposes that a certain degree of vascular turgescence, or phlogosis, must be present, to constitute this state in all animals, and that, although in the human being impregnation takes place seldom immediately previous to, and never during the presence of that discharge, yet the presence of that discharge is only a part of a more extended period, during which the state of vascular fulness remains. Dr Davis, obviously from this, believes with the majority of observers, that impregnation most frequently takes place immediately after the cessation of the menstrual discharge. We wholly agree with Dr Davis in his opinions on this subject. Vascular turgescence is almost the only appearance which is observed in the uterus and appendages of the lower animals when killed during this period; and we have long supposed, from this circumstance, that a certain vascular fulness takes place in the human female also. To account for this, Dr Davis imagines (we must say imagines, for it has not yet been proved), that the actual presence of menstrual discharge is only a part of the process of menstruation; that a certain degree of vascular turgescence remains afterwards "to insure the presence of the required susceptibility of impregnation."

In considering the subject of suppression of the menses, and noticing its treatment, Dr Davis's observations on the use of mercury as an emmenagogue ought to be well weighed by the profession. After treating of the usual remedies to be had recourse to in such cases, and many of which ought always to be tried previous to the use of mercury, he says, " One great emmenagogue, perhaps the greatest actually existing, viz. mercury, remains yet to be noticed. This important agent as a deobstruent, stands unrivalled in the materia medica; and it has often, under judicious administration, restored obstructed females to the due performance of the catamenial function, and, at the same time, to the possession of their pristine health and strength, after a long list of other remedies had been tried in vain. This excellent medicine, however, has been so often abused, whilst its administration requires great judgment and discrimination, that there exists a pretty general prejudice, both in and out of the profession, against its employment in amenorrhœa. In cases of recent obstruction, for example, excepting as a purgative, in combination with aperient medicines, there can be no necessity or even any propriety in the exhibition of any form of mercury."

" This powerful agent is only proper in chronic cases, when the balance of the different actions of the body is become much disturbed, and when it may be a matter of considerable probability that organic disease may already be about to commence its dangerous operations." " An amount of ptyalism, only sufficient to be accompanied by a moderate excitement of the heart and arteries, is required to be produced." " The average period of a mild constitutional affection, including throughout the whole of it a moderate affection of the mouth, should extend, at least, over fourteen or fifteen weeks."

Quicksilver we have always looked upon as a remedy which had in this disease already been set aside by the profession. Many chronic cases occur where almost every thing fails, and which become extremely perplexing to the practitioner. In such cases we might venture upon a very moderate use of the mineral; but numerous reasons concur in showing that, though some patients might submit to its use, it should in no case be continued for the length of time recommended by Dr Davis.

The next chapter treats of certain functional diseases of women, in which the subject of hysteria is fully discussed, the causes of sterility are considered, and even the causes of sexual impotence in man. Following this is a chapter on peculiar conformations and structural diseases of the uterus. The subject of *procidentia* and *prolapsus uteri* is here pretty fully discussed, and, as it has been made the subject of Dr Hamilton's opening chapter, we are tempted shortly to advert to the subject.

Prolapsus of the Uterus.—From the frequent occurrence of this disease, its annoying, nay, sometimes even disgusting nature,—the sufferings which its unfortunate victims undergo,—and the confirmed broken health which so often results from it, its scientific treatment becomes an object of the greatest importance to every practitioner. Dr Hamilton, after describing the symptoms and progress of this disease, goes on to combat a very generally received doctrine, that the sufferings of the patient are proportioned to the degree of the disease, and also that there should be any such division, as that of the stages of this disease, proposed by Gardien and adopted by Dr Davis and others, viz. relaxation, falling down, and protrusion. We quite agree with our author in the propriety of not attending to artificial distinctions of this kind. They are only calculated to embarrass the student and young practitioner, without being of the slightest use to him in practice,—many cases occurring where all intermediate stages between those named are to be found. Peculiarity of constitution seems to have more influence on the general health, than the degree of displacement. Delicate females in the higher ranks suffer much more from a very slight displacement, than those of the lower ranks do even from a protrusion ; and Dr Hamilton records a case where a poor woman with a protrusion, " which in size, equalled a quart bottle, and in whom both the protruded parts and the external surface of the thighs were extensively ulcerated, maintained for four years an epileptic husband and four children, by the laborious occupation (now exploded in this city) of a water-carrier."

Prolapsus uteri has been noticed by Dr Hamilton, as by other authors, not to be confined to women who have had a family, but to be occasionally noticed in virgins and in females, who, although married, have not conceived ; an opinion which is supported by numerous cases from almost every obstetrical writer. Our author opposes the generally received doctrine, that prolapsus of the womb arises from relaxation of the ligaments ; an opinion which we are not a little astonished to find Dr Davis still supporting. " It will be found," says Dr Hamilton, " that, in every case of *prolapsus uteri*, the vagina, or bladder, or rectum, or muscles lining the pelvis or filling up its outlet, are debilitated or lacerated, and therefore the relaxation of the peritoneum and its productions (the ligaments of the uterus) is the effect of the prolapsus, not the cause." In the case of virgins, Dr Hamilton refers it to exertions during menstruation ; a time when it is well known the contents of the pelvis are in an extremely relaxed condition. Such may occasionally be the case. But there are certainly many cases on record of the protrusion taking place in virgins and unimpregnated women who have never had children, where the menstrual function had been stopped for some time.* We are inclined to refer, with our author, most cases to relaxation of the pelvic contents and external parts, as after child-bearing; but in virgins to relaxation, either arising from menstruation, or extreme delicacy of constitution, combined with some accessory cause, as that of much bearing down to relieve the rectum or bladder, or of sudden exertion, as recovering from a fall, or any sudden action of the abdominal muscles.

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* Edinburgh Medical Essays, Vol. iii. p. 282, and Mauriceau ; also Dr Davis, 2d edit. p. 390.

The treatment which has been hitherto pursued in cases of prolapsus, are keeping the horizontal posture, the application of cold to the external parts and vagina, with the internal use of tonic medicines. All meet with our author's approval. Against the employment of pessaries he enters a decided protest, and has long urged the following objections;—that they only act as palliatives; that they keep up continued irritation in the passages; that, unless properly adapted and frequently taken out and cleaned, they make injurious pressure on the contents of the pelvis, and become extremely irritating; that they subject the patient to the care of the medical attendant for life; and lastly, that cases from time to time occur where, from laceration of the perineum, &c. no ordinary pessary can be used. Dr Hamilton recommends, instead of the pessary, a T bandage, "with a cushion interposed between the outlet of the pelvis and the cross strap of the bandage;" and, "in every case of *prolapsus uteri* to which he has been called for several years past, he has suggested this very simple contrivance." Our author, we fear, however, is rather exclusive in his denunciation of pessaries, although he is supported by recent and very high authority on the subject, (Osiander.) We believe, however, that while most cases are simply and easily treated by the T bandage, as recommended by Dr Hamilton, many cases will be eqnally benefited by the use of pessaries, and without any of those ills which Dr Hamilton has enumerated. Many of them, indeed, such as their being only palliatives, and subjecting the patient to the care of the medical attendant for life, apply equally to the one as to the other.

Professor Davis, on the contrary, is extremely partial to them, and has given most minute details regarding their forms and use. Of one suggestion, however, of Dr Hamilton's, it is our duty to make especial mention, as it is not likely to be anticipated *à priori*, that this contrivance enables patients to take walking or riding exercise, or exercise congenial to health, and the only condition necessary being, that, if the "patient has been long confined to the horizontal posture, such exercise must be cautiously begun." Had such a method of treatment emanated from a man of less experience and understanding than Dr Hamilton, we would have been more scrupulous in adopting it in practice; but we have had opportunities of seeing its beneficial use, and of hearing satisfactory accounts of its great comfort to the patients.

Dr Hamilton's concluding paragraph to this chapter is worthy of the notice of all those actively engaged in practice. "He still sees patients, from various quarters, to whom the use of sponges, of pessaries, and of astringent lotions, and the horizontal posture have been recommended; but he has generally found that the medical advisers of such patients were gentlemen too much engaged in practice to read modern works, and to attend to modern improvements."

Of one remedy which has been very strongly, and we believe very justly, recommended in this disease, Dr Davis makes no mention. This is the utero-abdominal supporter of Dr Hull, which is said to present all the advantages of the T bandage and pessary without any of their disadvantages. This we can recommend strongly, from having witnessed its beneficial effects. At the same time it cannot be denied, that, in order to confirm the justice of the recommendations by which its employment has been supported, it would require to be more extensively used than it has hitherto been.

According to the statements of Dr Hamilton in the present work, this contrivance, for which Dr Hull has taken out a patent, is virtually upon the same principle as that recommended and long used by Dr Hamilton, only much more clumsy and unwieldy, and also greatly more expensive; and in proof of the accuracy of this allegation, the author publishes in a note to p. 18, the affidavit of Mr Fortune, bandage-maker, to the effect that he had been in the habit of making among other bandages, for at least ten years, one quite similar in principle to the utero-abdominal supporter of Dr Hull. On the merits of this question we do not pretend to offer an opinion. But if the instrument or contrivance recommended by Dr Hamilton be so similar in principle to that for which Dr Hull has secured by patent, the conduct of the latter gentleman we cannot commend.

Dr Hamilton's observations on *Polypous Excrescences of the Uterus* are fraught with much practical information.

"The most ordinary symptoms of polypous excrescences of the uterus is an increased flow at the usual menstrual periods, accompanied sooner or later with a discharge of coagula. After a certain progress, there supervenes between the periods a continued drain, in more or less quantity, of what has been vulgarly called the whites, accompanied with a sense of weariness in the back, and in some cases with a sense of pressure or bearing down on walking or standing." "In the further progress of the disease, the draining from the vagina increases in quantity and becomes acrimonious and offensive. When this change happens, the state of the general health is rapidly impaired, œdematous swellings of the lower extremities follow, and, if no effectual means be employed, the patient sinks exhausted."

The termination described is by much the most frequent, when the disease has not been detected, and is allowed to cut off the patient; a melancholy case of which we ourselves had an opportunity of witnessing not long ago. The increased discharge at the monthly periods, and the frequency of leucorrhœa in this disease, are symptoms on which practitioners are in the habit of placing much reliance. Our author, however, has related several most important cases, (see pages 25, 26,) where such were awanting.

With respect to the texture of such tissues, Dr Hamilton states that it is sufficient for the practitioner to know, "that, in some cases, the substance is as soft as a clot of blood, in others as firm as the hardest steatom, and that between these extreme grades, there is every degree of consistence." Dr Davis, on the contrary, has entered into a most minute description of the different varicties of this disease, and has adopted the different designations of cellulo-fibrous, muco-lymphatic, vascular, vesicular, spongy, and granular. We have not as yet, however, come to any satisfactory data by means of which the one or other of these is to be distinguished in practice.

The source of hemorrhagy in this disease is here also brought under our notice. Dr Hamilton is opposed to the opinion of Gooch and others, that it proceeds from the surface of the polypus; from the circumstance, that rough handling the excrescence does not make it bleed, and that the amount of hemorrhage bears no proportion to the size of the polypus. He believes that the bleeding arises from the uterine vessels in the immediate neighbourhood of the polypus, in consequence of the increased determination of blood to the uterus during the disease, and the increase of size of the womb, keeping pace with that of the tumours; "slight circumstances, therefore, must produce a discharge from the uterine vessels in the immediate neighbourhood of the polypus."

We entirely coincide in this opinion of Dr Hamilton's. We well know, that when these vessels of the womb are enlarged, as during the earlier periods of pregnancy, and any partial separation takes place of the ovum, and the consequent exposure of the mouths of the vessels, how great and alarming the bleeding sometimes becomes. We also know that very few cases are on record where any vessels whatever could be detected in the substance of the polypus; and the additional fact, that hemorrhages as great have been noticed from the smallest as from the largest polypus, induces us to believe that it is from the uterine vessels in the immediate neighbourhood of the polypus that the bleeding arises, and not from the polypus itself.

Amongst other cases, we find recorded a fatal one of uterine hemorrhagy, "three weeks after delivery, where the only apparent cause was a polypous excrescence, not larger than a horse-bean, situated upon the external posterior surface of the uterus, about three inches above the orifice." Such cases would appear not to be so extremely rare, as we find Dr Churchill making mention of two having occurred in his practice, one of which also proved fatal. This patient died eight or ten hours after delivery; and, "upon examining the uterus after death, there was found a large cellular polypus, depending from the fundus, and which, it was evident, had prevented the due contraction of the uterus."*

Dr Hamilton advocates the use of the ligature alone, as the safe mode of operating in this disease; and he recommends the use of unalloyed silver wire, with a triple cannula; for the particulars regarding the wire and cannula we refer to the work itself. He condemns excision of the polypi by the knife or scissors as dangerous, and often impracticable. While our author has been extremely successful in the treatment of this disease with the ligature alone, we cannot banish from our minds the fact, that other practitioners of undoubted respectability have been equally successful by excision. Thus Dupuytren removed with success nearly two hundred uterine polypi by excision, and without any application of a ligature. His example has been followed by many French and German surgeons and accoucheurs, as well as by many British practitioners.

The fact, however, of the operation of excision of uterine polypi having proved fatal by hemorrhage, and the additional one, that occasionally vessels of considerable size are to be found in the tumours, would lead us to be cautious in determining upon this operation. We should be inclined to advise, from all that we have read and seen in practice, to try the effect of torsion in cases where the polypus was small, pedunculated, and attached to the lip of the uterus; to use the ligature in all cases where pulsation can be felt in the neck of the tumour, or where the peduncle is very thick, and probably containing large and numerous vessels. To practise excision even in such cases after the use of the ligature, and in all others as certainly the speediest means of getting rid of the tumours, and one which does not entail the prolonged and disagreeable process of separation by gradual sloughing, we prefer, with Siebold and Mayer of Berlin, the use of the scissors to the knife, and they should be round-pointed and curved like the Italian *ſ*.

Passing over the chapter on Enlargement of the Ovary, as our space will not permit us to do more than mention that it contains thirty-five pages, full of valuable and original information on the subject, we come to the next chapter, on the Evidences or Signs of Human Pregnancy. This is a subject on which our author professes very peculiar and yet decided doctrines; and, in consequence of the importance of the subject, and its almost daily occurrence in practice, we cannot pass it over without expressing our opinions on it. Dr Hamilton "undertakes to prove that, both in the early and the latter months of pregnancy, there are invariable signs marking that condition of the system." He therefore divides his chapter into two sections on the signs during the early, and during the latter months of pregnancy. It is chiefly during the earlier months of pregnancy that the diagnosis is now-a-days to be considered difficult; we say now-a-days, for the use of the stethoscope enables us most unequivocally to decide as to that condition during the latter months. Our " author has no hesitation in asserting, that there are two circumstances which invariably attend pregnancy during the early months, viz. suppression of the catamenia, and a perceptible change on the surface of the mamma surrounding the nipple."

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* Churchill on the Diseases of Females, p. 19.

Dr Hamilton seems to have founded his belief on the impossibility of menstruation during pregnancy, from reasoning regarding the condition of the interior of the uterus, and the plugging up of the *os uteri* during that state. " It does not consist with the experience of the author, that there ever was, strictly speaking, such an occurrence." We believe with Dr Hamilton, " that there never was, strictly speaking, such an occurrence;" knowing, as we do, that the true menstrual secretion proceeds from the interior of the uterus and Fallopian tubes; but we also know that many cases have been recorded, on the most respectable authority, where a discharge much resembling the menstrual secretion, continued during the whole of pregnancy, and more especially during the earlier months, which is an uncommon occurrence; and also that there are several cases on record where that function (menstruation) was alone performed when the females were pregnant.

As pupils of the late Dr Hamilton, we were deeply impressed with the truth of his convictions. But we were not long in practice before evidences so indisputable occurred, that it was impossible to withhold our belief, that menstruation may occur during pregnancy; and we fear that the opinion of our old preceptor must be modified amongst such a host of witnesses as have risen up against him. (Gooch, Dewees, Blundell, Velpeau, Montgomery, &c. &c.)

But while suppression of the catamenia may take place without conception, many cases also occur, where no confidence whatever can be placed on the statements given by the patients regarding this discharge; we therefore require to trust to something else than this, more especially in certain classes of cases.

The areola, which was so long the other established mark of pregnancy, is subject, according to our author, to many fallacies. Thus " in fair women, previous to impregnation, there is no perceptible discoloration round the nipple, excepting during menstruation, when a slightly marked circle, of a bluish hue, like milk and water, of various breadths in different individuals, commonly appears. When such women become pregnant, this circle is again apparent towards the end of the third month, and it gradually grows darker, so that after the fifth month it is of a brownish tint." "But in women whose complexion is dark, the nipple in the unimpregnated state is surrounded by a brownish circle, which, after the third month of pregnancy, gradually becomes darker, so as to resemble old mahogany." "Swarthy women, on the other hand, have naturally, in the virgin state, a mahogany-coloured areola, which, in the progress of pregnancy, is gradually converted into a black purple."

As there is every shade of complexion in different women, so do these changes vary. Women who have had a family, too, retain a discoloured circle around the nipple. In spite of all these sources of fallacy, however, our author distinctly states his conviction, "that the areola of pregnancy can always be distinguished by an experienced eye." What, then, is this mark on which Dr Hamilton has been led to place such implicit confidence? "For many years, the mark on which he has placed his principal reliance for distinguishing the true areola consequent upon impregnation, from the appearance of the surface of the mamma, peculiar to the individual in the unimpregnated state, is a certain degree of turgescence on the surface of the discoloured ring, which becomes more and more distinct towards the latter end of pregnancy." This is a mark which has been mentioned by Dr Montgomery, but on which he does not place so much reliance as Dr Hamilton. Dr Hamilton allows that there is a certain degree of turgescence similar to that he has described which occurs during menstruation. Now it must be obvious, that, were the case of a married woman to present herself with this appearance around the nipple; that even there was a slight discoloration there; that at the same time she asserted that she was quite regular, and that even she was menstruating at the time; we defy any practitioner whatever, from the signs and symptoms laid down, to tell whether or not the slightly altered colour of the areola and the turgescence of which we have just spoken, arises from menstruation or impregnation. We ourselves not long ago had a very perplexing case of this kind brought under our notice in private practice. We were summoned to attend a young female as speedily as possible. We were informed by the friends that suspicions existed that she was pregnant, in consequence of some recent conduct regarding a young man, who used to frequent the house. On making inquiry at the patient herself, we were informed that she was quite regular, and that she was menstruating at the present time. Upon requesting an examination of the mammæ, we were struck with the readiness with which they were shown, and the precise appearance which Dr Hamilton has described was presented. The nipple was small, and, as it were, retracted; the areola was a little darker than we could have expected to have found it, considering the complexion of the patient, and there was the distinct turgescence of the areolar ring similar to what Dr Hamilton has described. There were no enlarged glandular tubercles around the nipples, however, a test on which we are inclined to place most confidence; and we consequently pronounced the patient as not pregnant. The result verified the correctness of our diagnosis.

The tumefaction and moisture of the areolar ring, the darkening or change of colour of it, and especially the enlargement of the glandular follicles, may be looked upon as the most decided test of early impregnation. Of the three when taken singly, the last is the only one on which any reliance whatever can be placed.

On the signs of pregnancy in the latter months (which occupies Section 2d of Dr Hamilton's chapter on this subject) we find some interesting observations. He seems to place his greatest reliance on the movements of the infant. " Thus," he says, " for the first month after quickening, if the hand be applied over the region of the uterus, the movement of the infant feels like that of a ball suddenly rebounding from the part on which it is thrown; but after another month, when the infant moves, a bulky body may be perceived as if starting; and during the last two months, besides the starting, the infant can be felt to move occasionally its several limbs."

The above is an accurate account of what is noticed in practice; and when such a state of matters is found existing with the mammary appearances formerly remarked, and more especially if our diagnosis be confirmed by the practice of ballottement and the use of the stethoscope, it will afford the most perfect and decided evidence, even although complicated with other diseases.

The sections of Dr Davis's work on the signs and indications of pregnancy, appear to us to be much behind the present day in the information they communicate. Thus he takes up the work with sections on " Sickness and Vomiting," " Loss and Depravation of Appetite," " Loss of Flesh," " Projecting of the Navel," " Overwhelming Sleepiness in the day-time, and Frightful Dreams at night," " Heartburn," and " Increased Secretion of Saliva," all which are well known to be occasional accompaniments of pregnancy, but certainly are utterly valueless as signs or evidences of that state when there is any doubt in the matter. The above list, in our opinion, should be classed (probably with the exception of the sickness and vomiting) with those occasional symptoms which are collected at the end of the chapter, such as leucorrhoea, pruritus of the genitals, toothache, ear-ache, &c. and which are effects, but not symptoms of the pregnant state.

The space which Dr Davis has occupied in discussing the change of colour and sign of the areola round the nipple, might have been much better occupied by remarks on the tumefaction of the areolar ring (as published by Dr Hamilton in 1836), or on the enlargement of the glandular follicles around the nipple, as long ago mentioned by Roederer, and more prominently and lately brought under our notice by Dr Montgomery of Dublin, first in his valuable article on this subject in the Cyclopædia of Practical Medicine, and more lately in his work on the subject, published in 1837; no mention of either of which have we been able to find in the work. Another important omission we may also, when we are on this subject, mention, viz. the use of the stethoscope in the detection of pregnancy. It is now very generally looked upon by practitioners as not only a valuable assistant in the detection of pregnancy; but the only one for detecting whether the fœtus *in utero* be alive or dead. This we certainly expected to have found made mention of in a work which is professedly stated to be brought up to the present standard of knowledge.

As the process of parturition in its natural state, and incidental deviations form the principal object of the volumes before us, we shall commence our observations on this subject by considering those parts of them which contain what is new or what is contrary to the received notions of the profession at large.

With regard to the classification of labours, it is well known that almost every different author possesses a peculiar arrangement of his own, and that it is really a matter of little moment, provided the different parts of it be properly considered. The arrangement which Professor Davis follows is somewhat similar to that observed by the late Dr Hamilton. He divides them into Natural, when the head is the presenting part; Preternatural, when some other part than the head presents; Complex, when there are complications which "embarrass the function" and "compromise its results;" and Instrumental labour. The classes which Dr Hamilton makes, are Natural, Laborious, Preternatural, and Complex; each of which are divided into so many orders. We cannot but look upon it as improper in Dr Davis's classifying laborious, or protracted labour, as he calls it, amongst natural labours. They are only natural in one point, and that is the head presentation, the duration being quite unnatural, and that duration alone frequently producing the worst of consequences; and requiring the resources of art, they are the dystocia or abnormal parturition of Dr Merriman.

Dr Davis's chapter on the process of natural parturition, and the duties which devolve upon the practitioner, must prove highly useful to the young practitioner who is just entering on the duties of private practice. In the division of the different stages of natural labour, he has adopted the old one of Denman. The first stage, according to this distribution, includes all the incidents of a labour till the rupture of the membranes; the second, the delivery of the child; the third, that of the placenta. The generality of obstetric writers and practitioners of the present day look upon Denman's arrangement, as regards the first stage, as decidedly antiquated; and, to a man of Dr Davis's practical experience, we are astonished that he should have adopted it, as so many cases must at once occur to his mind where labour begun with discharge of the waters, where they were prematurely discharged, and where they were so rigid as to be delivered entire along with the child, as to show him that nothing is more irregular than the discharge of the *liquor amnii.* While this is such a fallacious sign, then, of the completion of the first stage, we have one which points it out without fallacy, and which is as easily determined as the other, viz. the full dilatation of the *os uteri.* It is one, too, which is all but universally adopted by obstetricians, and we think it a pity that such an antiquated division should be kept up by Dr Davis. "Examination during this period of the process, (viz. the first stage,) is seldom required to be resorted to more than once." We doubt the propriety of this maxim and the practice it inculcates, for although we object to unnecessary intermeddling during this stage, by frequent examination, &c. as calculated to do more mischief than good, by rendering the parts unnecessarily irritable, and liable to become undilatable and inflamed, we still think that more than one examination is necessary. We cannot surely be expected to ascertain every little point at one examination, such as the progress the *os uteri* is making at dilatation. This is a point which can only be ascertained by occasional examination.

Dr Davis, after the consideration of natural labour under its most favourable circumstances, comes to consider the subject of *protracted labours*, and first, "of labours protracted by rigidity of the soft parts," In perusing this section, we were not a little astonished to find the following passages, more especially as they contrast so strongly with the precepts laid down in the other work which is at present before us. "A merely slow dilatation of the orifice of the womb very rarely compromises the eventual safety of the case. Patience may perhaps be represented as the best natural remedy for this state of things, and the abstraction of blood in a full quantity, as the most efficient measure of artificial treatment. Bleeding, however, is seldom absolutely required, until after the orifice of the uterus shall have become completely developed, and the fœtal head shall have commenced its descent into the vaginal passage. As a difficult labour advances, there are occasions when the contractions of the uterus become progressively less powerful and efficient, until they might be expected to cease almost altogether. But in the greater number of cases of this description, the head descends slowly into the pelvis, and quite clears the orifice of the womb before it becomes finally arrested; for it often is arrested in its progress towards the outlet, if nothing be done to quicken and invigorate the action of the uterus. Under these circumstances, the author considers the abstraction of blood in sufficient quantity to reduce the symptoms of phlogosis, a measure of indispensable importance with a view to the preservation of the life of the child. The child's life is thus insured by shortening the duration of the labour—an object which full bleeding has, in a very remarkable manner, the effect of promoting."

This passage contains several statements which require a little consideration; and as they proceed from a person of the practical experience and authority of Dr Davis, and touch on a subject which has of late years given rise to much discussion in the obstetric department of the profession, and more especially between two men, eminent as the heads of their respective schools—Drs Hamilton and Collins,* —and involve principles of vital importance to the practice of midwifery; we conceive it our duty to state the conclusion at which we have arrived regarding this subject.

" A merely slow dilatation of the orifice of the womb, (says Dr Davis,) very rarely compromises the eventual safety of the case."

" Unless the first stage of labour (says Dr Hamilton) be completed within twelve or fourteen hours from its real commencement, the following consequences may be dreaded :—

" *Firstly,* That the powers of the uterus *may* be inadequate to expel the infant with safety to its life, or to the future health of the patient.

" *Secondly,* That, after the birth of the infant, the uterus may contract irregularly, so as to occasion retention of the placenta.

" *Thirdly,* That, after the expulsion of the placenta, the contractions of the uterus may be too feeble to prevent fatal hemorrhagy; and

" *Lastly,* That, supposing the patient should escape all those untoward circumstances, febrile or inflammatory affections of a most dangerous nature *may* ensue, from the previous protraction of pain, and the irregular distribution of the blood."

What Dr Davis understands by " a slow dilatation of the orifice of the womb" we know not. Probably, he may consider with the practitioners in this part of the country, that fourteen hours is a sufficiently prolonged time for the dilatation of the *os uteri*; but that a dilatation of the orifice of the womb, going on, as it is often allowed to do in England, Ireland, and on the continent, to twenty, thirty, and even sixty hours, " rarely compromises the eventual safety of the case," we cannot admit.

But this brings us to consider the point on which so much has been said and written regarding the duration of the first stage of labour, and the propriety of assisting that end by supporting the *os uteri.*

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* The first edition of Dr Hamilton's Practical Observations was published in 1836—37, and the discussion between Dr Collins and him carried on in 1837—38—39; the date of the volume before us in 1841.

It is well known that Dr Hamilton was the originator of the practice, "that, *wherever there are regular pains*, the first stage of labour should be completed within twelve or fourteen hours from its real commencement." We find Dr Burns of Glasgow repeating the same doctrine. Against this principle, however, we have the opinions of almost all continental and English writers on midwifery; also, all the Irish ones; and, amongst the names of the latter who have figured in the contest, may be mentioned those of Drs Collins, Churchill, and Murphy. It has been argued from statistical data by the individuals just mentioned, that it is absurd to lay down any precise time at which to procure the completion of the dilatation of the mouth of the womb; that we ought to be guided by symptoms, and not by hours; for while one woman will suffer severely from a twelve hours first stage of labour, another will not suffer from forty hours of it; then why complete it always in fourteen hours? It has been again argued by the same parties, (from what we must confess, however, we think very limited statistical data*), that the duration of the first stage has no effect on the duration of the second; that is to say, that the second stage has been found (in a limited number of cases) to be as short when the first stage was allowed to exceed fourteen hours, as when it was got over under it. In addition, they argue, that supporting the *os uteri*, in order to produce its more speedy dilatation, is liable to increase its irritability and non-dilatability, besides producing often bad consequences. After a careful, and, we may state, impartial perusal of the arguments which have been brought in favour of this doctrine, and against it, we confess that the accoucheurs of England and Ireland have failed to convince us of the advantages, or rather, we should say, of the safety, of allowing the first stage of labour to be indefinitely prolonged. We have Dr Hamilton's testimony, that, in no case where he has had the charge of the patient from the beginning, since he adopted the above treatment (with the exception of cases of deformity of the pelvis or of disproportion of the infant), have any one of his patients been above twenty-four hours in labour, "and very few so long." The great success of Dr Hamilton's treatment of midwifery cases is generally known and admitted, and that no subsequent bad effects, from the treatment adopted, ensued, is abundantly proved.

In the cases which Dr Collins has recorded, where the first stage of labour was allowed to go on for forty, fifty, or sixty hours and more, the melancholy results are before the profession. It is useless to argue in favour of the results of these melancholy cases, that their proportion to the number of women delivered in the Dublin Lying-in Hospital was extremely small,† for it must be very obvious, that, had there been only one such melancholy case, instead of several which have been recorded, where the fatal results so most distinctly arose from the protraction of the first stage of labour,—that one, to an unprejudiced mind, would have been sufficient to demonstrate the evils of allowing the dilatation of the *os uteri* to be indefinitely prolonged. As labour is a natural process, we know that, in the majority of cases, little or nothing is required; we also know, that, in the majority of cases, when the first stage is prolonged beyond the time specified by Dr Hamilton, no bad result will follow; and we also know as surely, that, in all cases (with the exception of cases of disproportion), by the means laid down, by venesection, nauseating doses of tartrate of antimony, and supporting the *os uteri*, we may complete the dilatation of the mouth of the womb within fourteen hours, and the labour itself in twenty-four.

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* Churchill in Dublin Journal of Medical Science.

† The number of deaths during Dr Collin's mastership, was 1 in 100 cases; 164 in 16,414 deliveries; 42 of the 164 who died were above twenty hours in labour.

If the Dublin practitioners and others adopt any treatment whatever to procure the dilatation of the *os uteri*, as soon as possible, why not give a fair and candid trial to an additional part of the same plan of treatment, more especially when it has been stated by Drs Hamilton and Burns to be so efficacious?

The old maxim seems to have been attended to by Dr Hamilton, and neglected by those who advocate the prolongation of the first stage of labour until symptoms appear which render its speedy completion absolutely necessary,—that prevention is better than cure; that it is better to avoid the symptoms which may arise, and render the completion of labour absolutely necessary, than be guided by these when they appear. One point appears to have been especially forgotten in this controversy, and does not seem to us to have been sufficiently insisted on, even by Professor Hamilton; we refer to the shortening of the sufferings of our patient. This is a point of the most material consequence, and we do not envy the feelings of that practitioner, who, when seated at the bedside of his patient, and seeing her endure prolonged agony, would calmly allow the first stage of labour to continue for forty or sixty hours, when it might be completed with equal (we may say with Dr Hamilton, greater) safety to his patient, in twelve or fourteen. We therefore think, that, if no other argument whatever could be adduced in favour of shortening the first stage of labour, the above one would be sufficient alone to turn the attention of every practitioner, who has the common feelings of humanity, to its adoption.

But, *lastly*, Dr Hamilton's opponents state, that the prolongation of the first stage has no effect on the duration of the second; and yet they allow themselves, that the chief cause which gives rise to prolongation of the second stage of labour, is deficient action of the uterus in that stage. What, we would ask, is the most frequent cause of that weakness or loss of uterine efforts?

does it not most generally arise from previously prolonged uterine action, and now exhausted uterine energy?

We ask any practitioner of experience to bring to his recollection the cases where he has been called, in private practice, to apply the forceps; where symptoms loudly called for them; and where the uterine efforts were so feeble as to give no hopes of their completing the delivery; were not the great majority of these cases, cases where the first stage of labour (from mismanagement or otherwise) had been allowed to go on for thirty, forty, or fifty hours? We ourselves can speak from experience in this matter, and can recall numerous cases within the last few years, where we have been called in to patients chiefly in the hands of ignorant midwives, where the above state of matters presented themselves, and where the use of the forceps was necessary.

If we were to be asked what points in the practice of midwifery we are most convinced of the propriety and use of? we should certainly answer, the propriety of limiting the duration of the first stage of labour, and the beneficial use of the dilatation of the mouth of the womb,—we speak of its use, not its abuse. "Let not," says Dr Burns, "the principle suffer from its abuse, else where is the plan which could stand its ground?"

But to return to Dr Davis. "Bleeding," says he, "is seldom required, until after the orifice of the uterus shall have become completely developed, and the fœtal head shall have commenced its descent into the vaginal passage." We allow with Dr Davis, that blood-letting in this stage is also sometimes necessary and advantageous; but for once the practitioner requires to bleed in this stage of labour, he ought to bleed twenty times before the "complete development" of the *os uteri.*

Dr Davis lets blood when the utility for blood-letting is over. Other practitioners bleed to shorten the first stage of labour; and, while it does so by relaxing the fibres of the *os uteri*, it at the same time relaxes the external parts. We are sorry to find Dr Davis inculcating doctrines like the above upon the student and young practitioner.

The management of the second stage of labour occupies nine pages of Dr Hamilton's observations, and in this division we find that he deviates little from the received opinions of the present day.

When the head is beginning to press upon the perineum, Dr Hamilton, along with the generality of foreign and British practitioners, recommends that the hand, without any covering, be applied over the perineum, the fingers and the thumb between the vulva and the thighs on each side, to prevent its rupture during the passage of the infant's head. Dr Hamilton recommends that the right hand be used for supporting the perineum during the passage of the head; but that, as soon as the head is born, and the state of the cord round the neck examined, we are to change hands, substituting the left, and assisting with our right the body of the infant, by pressing it upwards towards the pubis. Why not use the left hand throughout, retaining the right for keeping back the head, as Dr Davis recommends, or examining the progress the pains are making? The frequent removal of the right hand for the purpose of examining, falls under nearly the same objection on which Dr Hamilton has so strongly insisted,—that the right hand should never be removed without the bed-clothes when the head comes to press strongly on the perineum, for fear of sudden laceration of it.

Dr Davis's observations on this point are as follow. In saving the perineum from rupture, " we accomplish our object most effectually, not by applying the palm of the hand to the perineal tumour, as erroneously directed by some writers, but more directly and dexterously by opposing the whole of our modifying force, by the application of the points of the fingers and thumb of the right hand to the presenting part of the fœtal head." As soon as the head is born, Dr Davis recommends that no more pressure should be made on the perineum, but that we should try and hook down the arms and bring out the hands. Dr Davis certainly differs from most writers on this subject. We still, however, think that the plan of supporting the distended perineum with the palm of the hand, not only the plan the most natural for saving a distended part from rupture, but also the most gratifying to the patient. With regard to the last mentioned plan of removing the supporting hand altogether, and employing it for hooking down the elbows. it seems to us rather a hazardous one for the perineum; for it has been strongly urged by late authors, and more especially by Dr Rigby, that the passage of the head is not the greatest moment of danger to the perineum, laceration being much more liable to occur during the expulsion of the shoulders; for any slight rupture of the anterior edge produced by the passage of the head is then liable to be converted into a considerable laceration, if not properly protected during the passage of the shoulders and thorax.

In the treatment of the third stage of labour Dr Hamilton recommends several important rules to be adopted, in which we entirely concur, viz. " to interfere upon the first threatening of haemorrhage, and, when there are no untoward symptoms, to wait no longer than one hour for the natural efforts." We willingly admit with Dr Hamilton, that the first symptoms of hemorrhagy before the expulsion of the placenta are often so slight as to be overlooked. The trickling of blood, the occasional gush, or discharge of a coagulum from time to time, are not sufficient in general to excite any alarm, as, in the great majority of cases, the placenta is extracted or comes away naturally after a short time, during which the previous symptoms have been going on; but while this is the most common occurrence, it is well for the practitioner always to bear in mind, that, not unfrequently after a short continuance of the phenomena now mentioned, alarming symptoms suddenly supervene, and then," as Dr Hamilton expresses it, "the tardy assistance of the practitioner proves unavailing. It is therefore the duty of the accoucheur to be on the watch for such symptoms; and it is certainly a good general rule not to wait longer than "one hour" for the natural efforts in throwing off the placenta.

The ordinary plan of treatment in adherent placenta is, after the introduction of the hand, to pull off the placenta from the uterus. Dr Hamilton, however, remarks that he has never met with a case where he could not succeed by simply getting at the root of the chord, and puckering up the fœtal side of the after-birth towards it. In this way the edges first separate, and then the root easily follows. In no part of Dr Hamilton's work has he said that he always succeeded in this practice, for it is certainly more than many of his pupils can say. The practice of first attempting to pucker up the placenta towards its centre is always advisable; and should be first tried before attempting any other means, as, by this means, you avoid any risk whatever of either tearing the uterus or irritating its surface. But we are sure that this practice will not unfrequently fail; at least it has done so in our hands.

The chapter "On the Ordinary Management of Women after Delivery" is lengthened, but full of practical information, and many minute points, which can alone be appreciated by those who have been harassed by endless questions and interrogations of those who frequent the lying-in chamber. Dr Hamilton combats the old notion, that the diminution of size of the uterus after delivery arises from increased contraction of its muscular fibres. It is well understood now to arise from increased action of the absorbents.

"As soon as the placenta is detached," (says Dr Hamilton,) "moderate and equable compression of the abdomen, by means of a roller, ought to be made without delay."

"With some members of our profession," (says Dr Davis,) "it is a pretty general practice, after the business of parturition is over, to encircle the patient's waist with a broad belt or bandage, for the several presumed purposes of reducing the abdominal protuberance, and of giving tone and firmness to the relaxed parietes. But, for the last fifteen or twenty years, he has very rarely had recourse to it, excepting in cases of threatened hemorrhage, in the treatment of which its use is often of indispensable importance."

The reasons which Dr Hamilton and others assign for continuing the use of this practice, when it is so little had recourse to by our English brethren are, *first*, that it prevents fainting from the sudden emptying of the abdomen, by affording support to the abdominal walls; *second*, it assists in reducing the abdominal protuberance, several remarkable instances of which Dr Hamilton has related; and *third*, it affords a proper support, and materially assists the contractions of the uterus, preventing hemorrhagy, &c. —reasons which we agree with Dr Hamilton in believing are sufficient to recommend the use of the roller after delivery. If any argument more forcible than another could be brought forward in favour of the above practice so generally followed by Scottish practitioners, it would be found in the following passage from Dr Davis's works.

> "The first inconvenience which usually occurs to a woman speedily after delivery, is a slight disposition to fainting; it is probably the consequence of the uterus being somewhat suddenly emptied, and is, therefore, analogous to the fainting which succeeds to the operation of paracentesis of the abdomen, in cases of great previous enlargement and distension of that cavity, from ascitic dropsy. When fainting takes place soon after delivery, and when it is the effect, simply of the cause just noticed, it is a symptom of a merely temporary duration, requiring no particular treatment. The admission of air into the room, the application of a bottle of hot water to the feet, and the exhibition of small quantities of some mild cordial, or a draught of cold water, will generally suffice to restore the patient to a state of comparative comfort, and, at all events, to a sense of security." "In cases of considerable fainting, however, the circulation often experiences great reduction of strength, which should ever engage the instant attention of the medical practitioner; inasmuch as syncope from loss of blood might, by possibility, prove the cause of sudden death. An extreme degree of syncope is indeed, in a majority of cases, an effect, either of profuse hemorrhage, or of rupture of some vitally important tissue; although cases of sudden death have sometimes occurred in the puerperal state, for which the nicest examinations subsequently have not been able to detect an adequate cause, the author has already had occasion to notice this fact.
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> "There have been few persons extensively employed in the practice of midwifery for any considerable number of years, who have not met with repeated examples of fatal syncope in the course of their practice. The late Dr John Sims once reported to the author, that he scarcely knew of any practitioner of extensive experience and eminence in his profession, who had not had the misfortune, on one or more occasions, of meeting with this formidable variety of syncope."—P. 879.

However consolatory the opinion of Dr Sims now quoted may be to English practitioners, we venture to state that few in this country can apply it practically. Fatal syncope, indeed, occurring immediately or shortly after labour, is an extremely rare occurrence. Dr Collins has not related a case of it occurring out of the 16,414 patients, delivered in the Dublin Lying-in-hospital, under his mastership. It must also be mentioned, that no case occurred in the records of the Edinburgh Hospital, which could not be referred to the existence of disease of the heart, while we have a sufficiently deplorable account of it in England, from the words of Dr Davis himself. The one class of practitioners, indeed, are particular in keeping up compression of the abdominal parietes by means of a binder; the other are not. So much for cases of fatal syncope; but we venture to state as much regarding Dr Davis's first observation, and look upon fainting occurring shortly after delivery,—a circumstance, as the profession is practised in Edinburgh, of very rare occurrence, indeed, and these almost alone connected with hemorrhage. It is a usual occurrence, according to Dr Davis.

It is hardly fair, however, to include all English practitioners (as Dr Davis has done) in this statement regarding the practice of applying the roller after delivery. In Scotland, it is commonly applied after the third stage of labour is completed; but Drs Collins, Conquest, and Murphy, have even gone a step further, and recommend its application previous to the expulsion of the placenta. They conceive that it affords a proper support to the abdominal parietes; a support which is necessary for the due and proper contraction of the uterus, so that it may throw off the afterbirth. We look upon this practice as a decided improvement in the treatment of this stage of labour, and that, if the practice so strongly recommended by Drs Clarke and Collins is followed, viz. "to pursue with a hand on the abdomen, the *fundus uteri* in its contraction until the fœtus be entirely expelled, and afterwards for some time continuing this pressure, to keep it, if possible, in a contracted state;" and then, by applying a broad binder firmly around the abdomen, few cases of retained after-birth, requiring the introduction of the hand, will occur, and certainly, also, a less number of those melancholy cases of hemorrhage, between the birth of the child and placenta.

Dr Hamilton specifies particular rules regarding the use of purgatives after delivery, his ordinary plan being, unless the bowels have been unequivocally and freely cleared previous to labour, to give a dose of castor oil or aloes, combined, if necessary, with some narcotic, as soon as the woman has recovered from the shock of labour. We certainly agree with Dr Hamilton, in believing that the use of a good brisk purgative is called for as soon as possible, after delivery, when the bowels have been allowed to be much constipated previous to the occurrence of labour, and when they have not been moved during that process. But in by far the majority of cases, we find that the bowels have been regularly moved, and are moved during labour. In such we cannot agree with Dr Hamilton, in recommending that a purgative be given immediately; if it be given in the course of a few hours it operates, producing several stools, on each of which occasions the patient must sit up in bed, which posture, besides producing an unnecessary determination of blood to the uterine organs, renders it possible that, in the relaxed state of the contents of the pelvis, and muscles, and soft parts at the outlet, prolapsus might ensue. We believe it to be the custom of most practitioners of the present day, to exhibit a purgative on the second day after delivery, if the bowels have not been previously freely moved.

In cases in which the flow of milk is to be discouraged, Dr Hamilton recommends "a dose of some purgative, calculated to produce several loose chylous evacuations" "every second or third day," according to the strength of the patient, also covering the mamma with some gently stimulant liniment, which, according to Dr Hamilton, not only relieves the unpleasant feeling of tension, but also promotes the absorption of milk. "The preparation recommended by the author is, one ounce of unbleached bees'-wax, two ounces and a-half of fine olive oil, and two drachms of honey melted together."

We are inclined in addition to advise gentle friction to the surface of the mamma with the naked hand, covered with a little olive or almond oil, as being the most likely to assist the absorption of the milk, at the same time that it prevents any collection in any particular set of lactiferous ducts; a condition which we know to be the most frequent cause of mammary abscess.

The observations of our authors on the use of the ergot of rye in labours, attended with inertness or deficient action of the uterus, are far from being satisfactory. Dr Hamilton disbelieves entirely in its efficacy. He confesses, however, that he has only used it twice in practice, and that in both cases it had not the slightest effect.

The opinion of Dr Davis is expressed in the following passage. "In consequence of some signal failures in the earlier periods of his trials of the use of the ergot in lingering labours, the author became a very tardy believer in its efficacy as a parturient medicine. At present, however, he entertains no doubt of its being possessed, in this respect, of considerable power."

Both our authors have given a very confused account of the history of this drug as an obstetric agent. They have mixed this part of its history with its general history, and its effects on the human economy, when taken as an article of food, so that young practitioners may really have some doubts as to its being free from poisonous properties. It is well known that ergotted rye has been known as a *partûs accelerator* for a very long period.

Mr Wright, in his history of the Ergot of Rye, published in this Journal (Vol. lii. p. 355), makes mention, that the earliest account we have of its obstetrical employment is from Camerarius, who states, "that, about 1668, it was used by matrons in Germany to hasten the process of labour." It then fell into the hands of empirics, and afterwards its proscription was made the subject of legislative enactment in France in 1774. It continued, nevertheless, to be secretly used there, and to be made the subject of practical experiment in America; the result of which has been, that M. Desgranges in France, and afterwards Stearns, Prescott, Hosack, Dewees, &c. in America, have all written memoirs and letters on the subject.

It is a remarkable circumstance regarding the use of this medicine, that the accounts given of its efficacy as a quickener of labour-pains, by different authors, are very discordant. Thus while a host of very celebrated authors, among whom may be mentioned Le Mercier, Chaussier, Madame la Chapelle, Desmoreaux, Gardien, and Capuron, in France, and Hamilton in Britain, declare that it is perfectly inefficacious, or with Madame la Chapelle, that "son innocence est sa plus grande vertu;" others, again, amongst whose names may be mentioned Hosack, Moore, Holcombe, &c. reprehend its use, as producing such violent action that it always kills the fœtus. Even in the present number of this Journal, Dr Catlett ascribes to this drug such dreadful catastrophes as puerperal convulsions, hour-glass contraction of the womb, hydrocephalus in the infant, and similar maladies. The majority of both British and continental accoucheurs, we believe, may now be said to hold the opinion, that it is a most useful remedy in such cases in judicious hands. Like every other drug in the Materia Medica, it occasionally fails; and, what is worse, it is liable to be abused; but, if proper care is taken to procure it fresh, the number of failures in its use are not greater than that in the use of any other medicine; and it must be remembered, that arguments against its abuse are not arguments against its use. Its effects upon the infant are not mentioned by Dr Davis, and are thus stated by Dr Hamilton. "That it has injurious effects upon the infant, as has been so strongly stated by his friend, the late Dr Hosack of New York, he is disposed to doubt, believing that the instances recorded by Dr Hosack were accidental coincidences; for the evidence of the harmlessness of this medicine when given in moderate doses is satisfactorily established." Dr Hosack, as Dr Hamilton has stated, has mentioned its deleterious effects upon the infant, but which has been more strongly insisted upon by Dr Houston.* He says, "I have seen and heard that more children have perished by the injudicious use of ergot during the few years which have followed its introduction into the practice of this country, than have been sacrificed by the unwarrantable use of the crotchet for a century past." We believe it is a point on which there can be little doubt, that the indiscriminate use of the ergot very frequently produces the death of the fœtus; and that that death is produced by continued pressure we can easily understand.

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* North American Medical and Surgical Journal, January 1829.

When the ergot of rye is administered in cases where the *os uteri* is rigid, unyielding, and still little dilated; when the membranes are early ruptured; when disproportion exists either on the part of mother or child; and we could almost always say in first labours, either previous to, or immediately after the dilatation of the *os uteri*, such continued pressure is kept up on the fœtus as to prevent not only circulation through the chord, but through its body. When ergot acts, the uterine contractions produced by it are strong and continuous; with little or no interval. If we therefore can conceive an infant killed by the prolonged continuance of uterine contraction alternating with relaxations every three, five, or ten minutes, how much more readily can we conceive the destruction of an infant to take place from a much shorter continuance of continuous uterine action?

It is here where we think an error has been committed by the generality of authors, in not laying down more decided rules regarding the proper time for the administration of this drug. If administered at an early period of a labour, or in cases of disproportion, or in almost all cases of first labours, when the parts must naturally be rigid and undilatable, we are convinced that it is an extremely hazardous remedy for the infant; but if administered in cases where there is no disproportion; in cases where the *os uteri* is fully dilated, or is very dilatable; or where the external parts are relaxed as in a second labour; it is then a most valuable remedy, and seldom proves deleterious to the infant. The first is the abuse, the second, the proper use of the drug; and we have no hesitation in stating, that it is from the abuse, not the proper and warrantable use, of this medicine, that such bad accounts of it have been given. We have heard of its having been administered by country practitioners when the *os uteri* was no larger than a shilling piece and not very yielding, with safety to both mother and infant. This we do not question, and we are sure that many of our readers must have heard of, or witnessed such cases. So long as the bag of waters remains entire, there is no danger for the life ofthe child. Continued pressure, then, cannot hurt it; but let the bag become ruptured, the child has then to bear on every part of it the continuous pressure. Further,—there is not the favourable circumstance of the yielding bag of waters to assist in the dilatation of the *os uteri*; it does not yield so readily, and, consequently, the infant is pressed upon on all sides, and for a much longer space of time, and the chances are very materially against it, that in such a case it will be born alive.

The circumstances which favour the use of the ergot, the stage of the labour, and the class of cases favourable to its use, ought to be more precisely put down by obstetric writers. Dr Davis has made no mention of this, nor has Dr Hamilton. Dr Burns of Glasgow and others, however, have fully alluded to this circumstance, and we have much pleasure in quoting a passage from Dr Burns, as it illustrates our ideas on this subject, p. 414, 8th edition. "From the strength and constancy of the action when it is excited, it is evident that ergot ought not to be administered if there be any obstacle to the delivery of the child, which it cannot remove. Hence it ought not to be given if the pelvis be contracted, or the presentation unfavourable." "It ought not to be given unless the *os uteri* be dilated, and generally, unless the membranes have burst. No doubt, if the *os uteri* be very thin and dilatable, though not quite effaced, ergot might accelerate the process; but it is rarely in such circumstances that we can have occasion for the medicine." "The case proper for the exhibition of the ergot is that in which everything is prepared for delivery, the *os uteri* open, the parts lax, the pelvis well formed, and the presentation natural."

But this leads us to mention that the use of the ergot has been recommended to assist the production of premature labour.

On this subject, Dr Hamilton's chapter is of considerable length; and, from his having been very successful in its employment, deserving of high consideration. Dr Davis has altogether left out the consideration of this subject in the work before us.

The practice of inducing premature labour is almost wholly due to Dr Denman; for although he was not the first to put it to trial, he soon afterwards practised it, and was materially instrumental in disseminating it by the influence of his name and writings. It was strongly objected to at first by Dr Merriman in this country, and many celebrated accoucheurs in France, among whose names we may mention Baudelocque, Capuron, Gardien, and Madame la Chapelle, as an immoral and unjustifiable operation. It is not a little remarkable that the same individuals in France are amongst the names we have mentioned as being so inimical to the introduction of ergot of rye into practice.

Its morality can hardly, for a moment, be questioned, as its object is to save the life of an infant, which, if allowed to remain till the full term of pregnancy, could not be born alive. But its morality and safety no longer stand on theoretical data; we have ample statistical evidence to recommend it to our notice.

Professor Kilian has collected the results of 161 cases, where this operation was induced in Britain, Germany, Italy, and Holland. Of these 161 cases, 115 children were born alive,—and of these 115 living children 73 continued to live and were healthy. We cannot say whether or not Dr Hamilton's cases are included in Professor Kilian's list, but we shall give the result of his practice in his own words, "Previous to the 26th of January 1838, the author brought on premature labour in twenty-one individuals, on account of defective apertures, viz. in thirteen, one; in two, twice; in three, thrice; in two, five times; and, in one, ten times.

Of the forty-six infants thus prematurely brought into the world, forty-two were born alive.

"In the practice of Mr and Dr John Moir, (surgeon and assistant physician to the Edinburgh General Lying-in Hospital), premature labour was induced thirteen times on six women; ten of the infants were born alive." Dr Hamilton does not state how many of the infants continued alive either in his own practice, or that of Mr and Dr John Moir.

The original method of bringing on uterine contractions, was by simply puncturing the membranes; but, in consequence of the uterine action falling entirely on the infant, after the discharge of the *liquor amnii*, and of course proving much more hazardous to it, it was proposed by Brüninghausen and other German authors to dilate the *os uteri* as far as possible before puncturing the membranes. A great improvement was introduced by Dr Hamilton upon this method. He proposed that the uterine action should be brought on, by simply separating, by means of a catheter, the connections of the membranes and the *cervix uteri*. In this way the membranes are kept entire, which not only prevents the uterine action from injuring the infant, but also greatly facilitates the first stage of the labour, from the effect of the wedge of membranes on the *os uteri*. The result of this difference of practice is thus stated by Dr Hamilton, "from the above statement, it is evident that, of seventy-seven cases" (which Dr Hamilton has collected from the works of English authors), "of premature labour artificially induced by the previous rupture of the membranes, thirty-three infants were born alive; and that of fifty-eight infants brought forward in the same way, the membranes having been preserved entire, fifty-one were born alive. By the one practice, less than one-half was saved, while by the other more than seven-eighths were born alive."

Since the use of the ergot of rye has come into notice as useful for the production of premature labour pains, as mentioned by various recent authors, we cannot too strongly enter our protest against the use of this medicine, in cases where the premature pains are either brought on by the rupture of the membranes, or in cases where the membranes are accidentally broken in attempting to separate them from their attachment to the *cervix uteri*, as recommended by Dr Hamilton.

The cause of the greater mortality to the infant in the early method of producing premature labour by at once rupturing the membranes, was the great pressure to which it was subjected during the whole process of labour. If, then, the mortality, as regards the infant, was great when the natural contractions of the uterus alone produced it, how much greater must it prove when the uterus is excited into continuous and strong action upon the infant, after the rupture of the membranes. The generality of recent writers (Rigby and others,) recommend the ergot to be used in such cases; but, in our opinion, they do not sufficiently guard practitioners aganst its use after the rupture of the membranes, and while the *os uteri* continues undilated or undilatable.

In the course of the consideration of protracted or laborius labours, the subject of face presentations is very cursorily mentioned by Dr Hamilton, but at length by Dr Davis. The series of presentations of the kind undoubtedly constitute the most tedious and annoying class, and they require the utmost patience, fortitude, and perseverance of the accoucheur.

Without entering into the different positions in which the face of the infant may present, and of which Dr Davis follows the French authors in recording four, we would at once enter into the treatment to be adopted in such cases; more especially as that subject is very differently stated by the authors under review, and as they both differ from the treatment recommended by the majority of authors of the present day. Dr Hamilton's observations are completed in a few lines. He looks upon a face presentation as merely a modification of a natural presentation of the head, and to be treated in the following way: "When the face is forced foremost, the chin is, if possible, to be directed towards the nearer sacro-iliac synchondrosis, till it be brought in contact with the coccygaic muscle, when it is to be gradually turned into the arch of the pubis." "When the face," says Dr Davis, "is discovered to present at the brim of the pelvis at an early period of a labour, whether before or soon after the escape of the *liquor amnii*, there can, in the author's opinion, be no doubt as to the preference of turning to all other modes of treatment."

The interference which Dr Hamilton recommends, we shall afterwards show to be unnecessary; and while we shall prove the same thing regarding the interference advised by Dr Davis, we cannot feel that we are doing our duty to the profession without stating our unqualified disapprobation of the practice he recommends. We are sorry to find such emanating from a British practitioner; we are sorry to find such coming from a man of the professional experience and standing of the author, as it must inevitably lead to the destruction of human life.

It is impossible to calculate the mischief which such a doctrine as the latter produces. We well know the proneness of the student's mind to become rivetted to the doctrines of his teacher, and, before practical experience can teach him the erroneous nature of his belief, many an infant's life may in the meantime be sacrificed. To say the least of the practice of our author, it is a specimen of meddlesome midwifery. In the great majority of face cases, no alteration of the presentation is at all required, and far less is turning the child either expedient or necessary.

Of eighty cases of face presentation which occurred to Boer of Vienna, during a period of some years, three, or at most four, children were born dead, and in only one case did labour not go on favourably, where, in consequence of weak pains, he had to terminate the labour with the forceps.

In thirty-three cases of face presentation occurring in the Dublin Lying-in-Hospital, as reported by Dr Collins, four of the thirty-three children were still-born. No change of position whatever was had recourse to. Indeed, Dr Collins states that such labours should be treated as strictly natural.

"Some cases of face presentations," adds he, "I am inclined to think, were not noted, delivery having taken place so very speedily as to excite little attention, and caused it to be overlooked." Dr W. Hunter, R. W. Johnston, Alexander Hamilton, and others, might all be quoted, if our space would permit, to the same effect.

Dr Davis allows, that, "in a positive majority of such cases, nature might be relied upon for being eventually competent to accomplish her work;" and yet, in next page, (p. 661), he states his opinion of turning as preferable to all other modes of treatment, whenever that "operation can be had recourse to at an early period of these labours." It comes simply to be a question, then, whether the operation of turning, in such cases, affords, with equal safety to the mother, a better chance of saving the life of the infant. In the footling cases, (to which Dr Davis recommends the face ones to be turned into), the mortality to the infant, calculated from the Dublin Hospital Reports, is about one in four; while the average fatality to the infant from face presentations of all varieties trusted to nature alone, is about 1 in 14. While this points out the superior saving of life for the infant in leaving such cases alone to nature, it altogether leaves out of consideration the safety of the mother. Face presentations rarely prove fatal to the mother, from the result of the labour, if left to nature alone; while from Dr Churchill of Dublin's calculations, 1 woman in every 15 perishes from the result of the operation when the infant is turned.

Leaving out of consideration, therefore, altogether, the superior saving of life of the infant, are we justified, (and we put the question in all humility and candour to Dr Davis), in subjecting the life of a mother to the risk of an operation, which we see is not unfrequently fatal, for the sake of any supposed greater chance of saving the life of her unborn offspring, when the best statistical data show us that unassisted nature performs it best?

The above practice truly comes under the appellation of Meddlesome Midwifery, and reminds us of an advice long ago given by Dr Willoughby,* and which, although expressed in quaint and amusing terms, is not the less truly expressive :—"An egge representeth the wombe," says he, "now the hen with keeping the egge warm, doth breed the chicken, which when it comes to maturitie, doth chip the shell, and is by degrees hatched without injurie. These signatures may teach midwives patience, and persuade them to let nature alone to performe her owne worke, and not to disquiet women by their strugglings."

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* Published in the Introduction to Dr Denman's first edition, Vol. I. Willoughby lived in 1640 to 1670.

The subject of laborious, or protracted labours, deservedly occupies a large share of both of the volumes before us. It is here where the skill and acumen of a scientific physician is made manifest; it is here where information, experience, and patience are so imperatively required; and it is here where the character and reputation of the practitioner is either made or marred. We shall, therefore not hesitate to lay before our readers, as fully as our space will permit, any thing that may appear new or important on this most important department of obstetrics.

Dr Hamilton was early led to distinguish laborious labour by the duration of the process. He says, therefore, that, "in all cases where (the head of the infant being the advancing part), the labour is protracted beyond twenty-four hours from its real commencement, the case is termed difficult or laborious." This distinction, taken from time, has not been generally adopted by the profession; we therefore find Dr Davis and the most of recent English authors treat of the causes which protract natural labour, and do not class it separately, as Dr Hamilton has done.

Dr Davis has devoted separate sections to the protraction of labours from feeble or irregular uterine contraction, and inertness or deficient action of the uterus.

"Labours of this character," says he, "are often sufficiently painful, and almost always sufficiently anxious. The proper treatment is to subdue the irritation, and to endeavour to improve the quality of the pains by the exhibition of moderate doses of opium." We look upon the above recommendation of Dr Davis as one which ought to have been pronounced with more care. Dr Denman long ago warned the profession against the use of opiates in such cases; and many subsequent authors have repeated, and in strong language, the practice of Dr Denman; and while Dr Davis recommends the above practice alone in such cases, he neglects altogether to state the practice which is adopted by others in similar cases. Thus we find Dr Burns of Glasgow stating, "under this head may be included blood-letting, gently dilating the *os uteri*, rupturing the membranes, improving the position of the presentation, and exciting the action of the uterus, by cordials, heat, gentle exercise, clysters, spontaneous vomiting."

We well know that small and repeated doses of opium, more especially after blood-letting, is one of the best practices that can be adopted in such cases. It acts by stimulating the uterine fibres. It was against full doses of this drug that Dr Denman spoke so strongly; and with him, and many other distinguished members of the profession, we agree in thinking that more harm is likely to arise from the use of opium than of blood-letting. What we object to here in Dr Davis's remarks is, that he gives no recommendation whatever for the practitioner to try other treatment first, such as admitting free air into the chamber, blood-letting, stimulant clysters, change of position, gentle exercise, &c. but at once recommends the use " of moderate doses of opium." A moderate dose may be considered very differently by different individuals. The dose which we presume Dr Davis recommends is about half-a-grain or fifteen drops of laudanum, every hour till the pains are quickened.

The observations of our authors on the subject of the forceps are extremely interesting and instructive. Dr Davis has given an excellent history of them, and, from his mechanical genius, has not a little added to their improvement. This simple instrument, the merit of the discovery of which undoubtedly falls to the Chamberlens, is one of the safest means of artificial delivery which we possess; safe when judiciously and properly used both to the mother and child.

The unexpected length to which our remarks have already extended, preclude the possibility of our entering at all upon the subject of the different kinds of forceps, or of Dr Davis's suggestions, to use blades of different sizes. Our observations must be entirely confined to the use of the short forceps; and we shall chiefly bring under review some statistical data regarding the frequency of the use of this instrument.

It appears astonishing that although the forceps have been in the hands of European practitioners for nearly a whole century, that such very varied accounts should be given of the relative frequency of their use. We extract from Dr Davis's work and others, the following table, showing the relative frequency of the use of this instrument in various countries and places.

Boer[*] of Vienna used them,	1	in every 3 cases.
Hagen of Berlin,	1	9
Nægele of Heidelberg,	1	53
Burns of Glasgow,	1	53
Baudelocque of Paris,	1	353
Boivin,	1	212
La Chapelle,	1	166
Osiander of Göttingen,[†]	1	$18\frac{3}{4}$

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[*] It was not in his own practice but in that of others on whom he could rely.

[†] The cases most likely to require the assistance of art are always preferred in the obstetric school of that place.

Cederschjold, Stockholm, - - -	1 in every	100 cases.
Ludwig at Eikenfördt in Hotstein, - -	1	109
Lobstein, Strasburg, - - -	1	35½
Boer of Vienna (in his own practice), - -	1	238
Clark of Dublin, - - - - -	1	737
Collins of Dublin, - - - -	1	608
Hamilton, Edinburgh Lying-in Hospital, -	1	109
Davis of London, - - - -	1	92

From this table it will be observed what great differences exist regarding the frequency of application of this instrument; and while we cannot but reprobate with Dr Davis the highest proportional frequency in the list before us, yet we must admit that the error of too frequent application is much slighter than that of too much procrastination and delay. In no class of cases, we believe, is too great delay more injurious than in forceps cases, and in no class of cases is it more unnecessary. When the *os uteri* is fully dilated and the head has entered the pelvis, the application of the short, long, or intermediate sized forceps can be generally accomplished with the greatest ease, without almost any suffering to the patient, and with perfect safety to both her and her infant. We refer to cases of slight impaction or of weak and ineffectual pains. We must confess, that we, for our own part, prefer with Dr Dewees, the long forceps in all cases to the short. They can be used in any position or distance of the head within the pelvis; their form and the length of their handles give great and decided advantages to the operator, rendering his exertions more effective and very much less fatiguing; their mode of union is such as to obviate the very serious objection urged against the short, as they lock without the vulva in high situations of the head, and remote from it in the lower positions of it. Beginners in the use of the forceps should hardly attempt their application, at first, however, as they give the operator such an immense lever power, that, if great care is not used, they are both liable to injure the internal parts of the mother by their ends, and also the external parts by their handles. But if carefully managed their application is as easy, and their use as safe, as any instrument in the practice of midwifery. As a specimen of the late Dr Hamilton's writing, at the same time that it enables us to present to our readers his sentiments on the use of the forceps, we quote the following passage.

> "There is too much reason to believe that British practitioners, from their unwillingness to give pain, or to hurt the feelings of their patients, are apt to procrastinate, and to loose the favourable time for safe and effectual interference. No intelligent practitioner would wait in cases where the labour throes cease to have any influence in advancing the delivery of the head, if the infant be within reach of the forceps, till there be 'heat or tenderness of the passages,' and still less till 'the patient's strength be much exhausted."

"It is impossible to imagine a more erroneous description of the condition into which a woman in labour should be allowed to fall, before having recourse to the use of the forceps, than that given by Dr Osborne, (page 69.) Indeed, the great utility of this mechanical contrivance is, that it enables the practitioner to prevent the occurrence of those untoward symptoms which the Doctor has described as alone warranting the use of the instrument. Waiting till the powers of nature are absolutely and altogether exhausted, is a most dangerous doctrine. In page 57, Dr Osborne even hints at waiting for the third or fourth day before interfering. 'The obvious duty of the practitioner, in every case, must be to ascertain what the natural efforts can accomplish; and when he is satisfied that the delivery cannot be permitted to go on without some injury to the mother or to the infant, he is no longer to delay assistance. Keeping this principle in view, the time allowed for the efforts of nature must be regulated by the symptoms of the individual case."

We cannot but think with Drs Burns and Hamilton, that the reports of the Dublin Hospital most unequivocally show that too much trust was placed upon the natural powers to the neglect of an instrument so simple as the forceps. The report of that hospital by Dr Clarke shows, that the forceps were only had recourse to once in 737 cases, and in the same hospital, during Dr Collins's mastership, in 16,654 births, the forceps were only used twenty-four times. Every sixth woman on whom the forceps was used, died; and eight of the twenty-four infants were still-born. We find a very different result given of the practice in such cases by the authors before us. Dr Davis says, "that he does not recollect a single example in the practice of the Royal Maternity Charity, in his district, of a forceps operation having ever proved fatal to the mother; and since the year 1817, from which he has kept notes of all the principal incidents of his own practice in and out of that institution, he can speak with confidence, that such a result has only once occurred either in his public or private practice." Although this statement may be objected to, from their being no numerical data given, yet it must certainly appear obvious, that a man of the extent of practice, both public and private, of Dr Davis, for nearly twenty-five years, must have, at least, seen more than twenty-four cases where the forceps were required.

We have no means of stating precisely the result of the cases in which the forceps were used, either in the Edinburgh Lying-in-Hospital, or in Dr Hamilton's own practice; but we are sure that the mortality must have been extremely small, and certainly very much smaller than either that of the Dublin Lying-in-Hospital, or the Maternité at Paris, as reported by Madame la Chapelle.

Our space will not permit us to enter upon the remaining subjects discussed in the works before us.

The work of Dr Davis is written in a style which is not becoming in a didactic treatise. We have mentioned the work of Dr Denman as remarkable for the plainness, simplicity, and perspicuity of the style; and we think it is impossible to specify any obstetrical work, perhaps any work in medicine, in which the language of the author is at once so correct, and, at the same time, so free from that affected manner which many persons seem ambitious of adopting in medical writings. In the present instance all the descriptive parts, and many of the argumentative parts, are expanded much beyond their natural magnitude, by the number of words employed to express the most simple ideas, and by a general fondness for circumlocution. The whole work might have been compressed into much smaller bulk, had it not been for this little fault. As specimens of this, and to show that we do not complain unnecessarily, we may quote one or two paragraphs, taken at random.

"The proximate cause of metrorrhagia is probably a state of excessive plenitude of the secerning vessels of the uterus which, by over-distending them, and co-operating with the arterial propelling action bearing upon them from behind, has the effect of increasing the activity of the process of transudation by which the menstrual evacuation is produced."—P. 241.

"On the consummation of the actions of gestation, pregnancy is followed by the process of parturition." "In natural gestation, this power is ordinarily called into exertion after the lapse of forty weeks subsequently to the date of conception; whilst its advent at that period would appear to depend upon the entire accomplishment of the developments of gravidity."—P. 619.

We cannot conclude, however, without stating, that the work of Dr Davis contains much valuable information, and that it proves its author to be a man of great erudition in the history of the science, and a complete master of its practical departments. We do not, therefore, hesitate to say, that it is a work which ought to be found on the table of every teacher and practitioner of midwifery.

Of the work of Dr Hamilton, we need say little. That its author entertained peculiar notions, that he adhered to his own views very tenaciously, and rather underrated those of others, is well-known to the profession. But, amidst these defects, it is impossible to deny the present volume the merit of containing a large amount of valuable practical information.

ART. II.—*Three Memoirs on the Development and Structure of the Teeth and Epithelium.* By ALEXANDER NASMYTH, F. L. S., F. G. S., Member of the Royal College of Surgeons, &c. London, 1841. Pp. 47, and 9 Plates.

THESE memoirs were read by Mr Nasmyth before the British

Association at their ninth annual meeting, held at Birmingham in the month of August 1839; but, from some misunderstanding, they were omitted to be published in the Transactions of the Association for that year. The consequence of this has been, that erroneous statements of his views have been promulgated; and ever since then, the harmony which ought to subsist between inquirers in the same walk of science has been disturbed, by Professor Owen claiming as his own many of those views which Mr Nasmyth asserts he had the merit of first making known. Entertaining a very high opinion of Professor Owen, we cannot but regret that he should have laid his communications regarding this disputed subject first before the Academy of Sciences of Paris, instead of bringing them under the notice of the British public, where, if his opinions on this subject were original, they would have received their due meed of praise. This circumstance may with some favour the imputation of having assumed as his own the views claimed by Mr Nasmyth, and used this means of securing to himself on the Continent the merit of the discovery. When it is considered, besides, that Professor Owen's paper was not laid before the French Academy till fourteen weeks after Mr Nasmyth's memoirs were read before the British Association, it is to be feared that Mr Owen's researches can only be regarded as a corroboration of Mr Nasmyth's views; though there is nothing wonderful in two inquirers in the same walk of science arriving at the same conclusions. The originality of Mr Nasmyth's views will best be judged of by what follows.

Mr Nasmyth, in an introduction of sixteen pages, relates with great moderation and forbearance, the circumstances, so far as known to him, which have delayed the publication of his memoirs in the Transactions of the British Association, and forced him to adopt the present mode of laying them before the public. It cannot be for one moment supposed that the British Association would ever allow themselves to be influenced by private parties, so as to keep back the publication of any paper containing original discoveries; and there is little doubt but that the secretary of that Association will be able to give a satisfactory explanation of the cause of the delay.

The first two memoirs are devoted to the consideration of the Developement and Organization of the Dental Structures; the first having been read before the Geological Section, the second before the Medical Section of the British Association. They are both extremely short, so much so, indeed, that, were it not for the very beautiful and numerous plates with which they are illustrated, the author's particular views would run the risk of being misinterpreted or misunderstood.

Three subjects of inquiry are especially noticed by Mr Nasmyth,—1*st*, The covering of the enamel; 2*d* The structure of the teeth; and 3*d*, The structure of the pulp, and its relation to developement of the ivory.

In the first of these memoirs the author merely notices his investigations relative to the covering of the enamel in these words, "The membranous investment which I lately discovered as investing the enamel of the teeth of man and other simple teeth displays a similar arrangement," (reticular structure,) p. 11. In his second memoir, however, he enters a little more into the subject, and refers for the full detail to his paper read before the Medical and Chirurgical Society in January 1839, and published in their Transactions for that year. He there states, that the consideration of the existence of a layer of *crusta petrosa* on the enamel of the teeth of some animals led him to believe that there might be some analogous covering even in those cases where it appeared entirely bare. He accordingly subjected teeth to the action of dilute acid, and observed portions of membrane floating on the surface of the fluid. He afterwards succeeded in ascertaining this to be derived from the external surface of the enamel, and to be traceable in one continuous covering over the fang into the chamber of the tooth. He accordingly gave it the name of Persistent Dental Capsule. When separated by maceration of the tooth in dilute muriatic acid, it bore the appearance of the capsule of an unobtruded tooth, being fibrous externally, and reticulated internally. According to his representation, the reticulations have a hexagonal figure. Mr Nasmyth found that this membrane was continuous with the *crusta petrosa* of the fang; that, in fact, the *crusta petrosa* was but the same membrane converted into an ossific substance; and in the incisor tooth of the ox he discovered the characteristic ossific corpuscules of the *crusta petrosa* on that part of the membranous covering lying over the enamel of the tooth.

He also satisfied himself of the existence of a distinct layer of substance external to the *crusta petrosa* of the fang, where its thickness is considerable, and which he conceives to be a cartilage of it. As he has only seen this membrane when the layer of *crusta petrosa* was considerable, it is more than likely that it is simply the external capsular investment of the tooth converted into a bony substance by the deposition of ossific matter within its substance, the layer which is so generally described as forming the periosteum of the tooth.

Mr Nasmyth is not, however, the first who pointed out the fact, that the enamel is covered with a membranous capsule, nor yet that that membrane is converted into *crusta petrosa*.

Tenon, the Secretary of the Institute of France, in the year VI. of the Revolution (1798), published in the "Memoires de l'Institut," two papers chiefly relative to the teeth of the horse, but the substance of which had some years previously been communicated to that learned body. He may well be accounted the first who gave accurate views of the formation of the enamel and *crusta petrosa;* indeed to him is due the merit of discovering the *crusta petrosa*, and the membrane which formed both it and the enamel. Though his researches were intended chiefly to illustrate the dentition of the horse, they were by no means confined to that alone; and his descriptions of the formation and structure of the enamel, enamel membrane, and *crusta petrosa*, he applies generally to all teeth. He described the capsule within which the tooth was formed to consist of two layers, an external fibrous, and an internal fine transparent layer, separated from each other by a fluid. This internal layer insinuates itself into all the sinuosities of the tooth, and "is the generating organ of the enamel, and is only converted into an osseous substance after the enamel has been deposited, and forms a crust over the tooth."* After this membrane became converted into an ossified substance, he denominated it "cortical osseuse," now called *crusta petrosa.*

Frederick Cuvier, in 1825, described this membrane more fully. He showed that the enamel was formed from a membrane which was quite distinct from the capsular investing membrane, and to which, from its function, he applied the term "enamel membrane." "The enamel membrane," says he, "producing the enamel from its *inner* surface, envelopes entirely the tooth, and follows it in all its contours, in all its forms, excepting at the base of the bulb, corresponding to the neck of the tooth, where it ends and terminates." And again, "the translucency of this membrane and its extreme thinness, in fact, its entire obliteration in the teeth of which the crown is formed, have, without doubt, been the cause of its having been overlooked until now, *but once discovered, it is easily found in all teeth which have enamel.*"†

Raschkow in his Inaugural Dissertation, published in 1835, and entitled "Meletemata circa Mammalium Dentium evolutionem," claims as his own the discovery of this enamel membrane of Tenon and Cuvier, and denominates it the "adamantine organ or pulp, situate between the follicle and germ, and destined for the production of enamel." He has certainly the merit of being the first who described most minutely this organ in all its stages of developement, and also its intimate structure. It was by examining by the microscope the internal surface of this membrane, that he was enabled to establish the fact of its being the organic matrix in which the enamel fibres were deposited, for he found it to consist of "hexangular nearly uniform corpuscules;" these corpuscules being nothing else than the ends of short fibres, of which the whole membrane was composed, and which being pressed together freely assumed the hexangular form. In mentioning the mode in which the enamel is deposited within the cells of this membrane, he remarks that it is by a process of organic secretion that lymph is thrown out, which gradually enters into intimate union with earthy matters, and so forms the enamel. He also mentions that this membrane, excepting in the cases where only the crown of the tooth is covered with enamel, is always present, and in teeth which continue to grow during the life of the animal, may be discovered surrounding the basilar part of the tooth, where it is continually in the process of being changed towards the crown into an osseous membrane, which is always arising new about the roots, and in the middle is always depositing fresh enamel substance.

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* Mémoires de l'Institut National des Sciences et Arts. Paris, An. vi. p. 600.

† Des Dents des Mammiferes considerées comme Caracteres Zoologiques. 8vo. Strasbourg, 1825. p. xxii.

Relative to a layer of *crusta petrosa* covering the enamel of the teeth, Frederick Cuvier relates, that in many animals, as for instance in the classes Ruminantia and Rodentia, "a very thin layer of true cortical matter" is spread over the enamel, and that it is in this layer that the colour of the tooth, so remarkable in these animals, alone resides, as he satisfied himself from repeated special experiments.* The very name *cortical layer* was given to it by Tenon from its enveloping the other parts of the teeth like the bark of a tree. Even Retzius, who finds great fault with F. Cuvier for denominating the coloured layer in the teeth of the Rodentia by the name of cortical substance, actually himself describes the same coloured layer in the teeth of the Ruminantia, as being owing to the presence of this very substance, so that analogy alone, were other evidence awanting, would tend to prove that Frederick Cuvier was right.

It thus appears that the circumstance of a persistent membrane covering the enamel, and forming that substance, was known to Tenon, F. Cuvier, and Raschkow; and that Tenon, more than forty years ago, showed that wherever *crusta petrosa* was found, it owed its origin to the deposition of bony matter within the substance of this membrane.

Mr Nasmyth attributes to pressure on this membrane the removal of the fangs of the first or milk set of teeth; but, as we remarked in a former notice on this subject, the most probable explanation yet given is that of Delabarre, to which we refer.†

The second part of the author's subject is his "own views on the Structure of the Teeth." The latest researches into the minute structure of the teeth showed them to be composed of minute tubes passing through a substance which did not present traces of any particular conformation. Mr Nasmyth, by examining fine slices of teeth by very high magnifying powers, discovered that this substance was not structureless, but beautifully organized ; and he states, that " it is so differently and characteristically so in different animals, as to be capable of affording valuable aid to the naturalist in classifying the animal kingdom." He found that in every case the organization of the dental bone was cellular, and that the fibres running through it " present an interrupted or baccated appearance, as if they were made up of different compartments, an obvious concomitant of the cellular structure of the interfibrous material." When the fibres were deprived of their earthy ingredients by maceration of the tooth in acid, their structure was more easily seen, being apparently composed of elongated globules united in lines. These globular molecules were found to vary somewhat in form in different teeth, being oval in man, but rhomboidal in the orang-outang. He described these fibres when deprived of earthy matters as solid ; but in the very next page he states, that " in the reticulations they are collapsed, lying one above another, but, after having been deprived of earth, they will be observed to be rigid, and to retain the erect distended form which they acquired by the deposition within them of ossific matter."—P. 17. The general appearance of these fibres was similar to those of cellular tissue, and the diameter of each corresponded exactly to the diameter of the tube seen in the ivory of the tooth, which, according to Retzius, is pervious, but filled with earthy matters. It was also stated by Retzius, Müller, and others, that it was the contents of these tubes which rendered the tubes visible ; but Mr Nasmyth, apparently forgetting what he has stated in the sentence quoted above, remarks, that what they called the contents of the tube, are the only parts which exist, for the fibres are solid and not tubular.

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* Cuvier, p. xxix.

† See this Journal, Vol. liii. p. 164, and Delabarre, Traité de la Second Dentition. Paris, 1819, p. 80—81.

Mr Nasmyth observed the same cellular structure in the enamel. When a section of that substance was made in a direction parallel to the long axis of the tooth, he found that it consisted of a series of compartments or divisions, but of a different form from that observed in the ivory. Each compartment of the enamel was of a semicircular form, and the convexity of the semicircle or arch looked upwards towards the free external portion of the tooth.

Although Mr Nasmyth has added somewhat to our knowledge of the minute structure of the teeth, he is not the first writer who seems to have described the ivory or enamel as possessing a cellular arrangement. Malpighi,* in his " Anatome Plantarum," in comparing the minute structure of plants to that of the higher classes of organized beings, describes the bony part of the tooth as possessing a distinct cellular arrangement, and actually gives a figure in illustration of his views. He described this structure as being especially distinct in the tooth of the calf, the very tooth which Mr Nasmyth appears to have first used for his researches, and he says the structure of the ivory consists of "ossea lamella fibrosis et quasi tendinosis capillamentis in naturam retis implicitis."* In proceeding to describe this structure more at length, and explain the figure which he gives, he remarks, "Non longe a radicibus in exteriori lamella filamentorum, quasi ordines sursum deducuntur, qui lineam crispam ad lateram inclinatam designant. Non sunt autem continua corpora, filamentorum instar a radice ad summitatem producta, sed innumeri fere sunt contigui quasi pili, qui parum assurgentes talem designant lineam."†

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* Marcelli Malpighii Opera Omnia. Folio. London, 1687.

Malpighi, in the argument which follows, shows a more minute acquaintance with the process of the formation of the tooth than could have been expected. He mentions that the teeth are formed by the deposition of earthy matters in the animal net-work "qui et interstitia repleat, et ossea reddat;" and regarding the minutiæ of the process by which this takes place, he thinks it probable that the "adhuc fluidus et petrificus humor et spiritus separetur et extrudatur, qui sensim effluens et concrescens primo sub pilorum specie, tandem copiosus erumpens, adjacentia replendo spatia, metallicam et quasi petrificam largiatur naturam et solidatem."‡ To render his meaning more clear, he compares the process to the petrifaction of wood, where first the tubes, and then the adjacent cellular spaces become converted into stony substance.

No one on reading this account of Malpighi's description of the cellular structure of the ivory can do otherwise than acknowledge that it corresponds to a wonderful extent with that given by Mr Nasmyth. He even ascertained that the tubes, which Retzius and others described as continuous, were in reality fibres, presenting an interrupted or baccated appearance, as Mr Nasmyth describes them. It is not a little strange that the very first observer of the minute structure of the teeth should also have the merit of being the only one who for a century and a-half recognized the true constitution of these bodies.

Regarding the cellular structure of the enamel fibre, it was minutely described, and figured by Retzius in 1837, and though Mr Nasmyth says the cells are round, and not hexangular, as Retzius described them, as the matrices of the enamel fibres on the enamel membrane are hexangular, according to Retzius, and even to Mr Nasmyth himself, it is most probable Mr Nasmyth's description of their form is erroneous, and that the appearance he observed resulted from the cells having been cut obliquely across.

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* Marcelli Malpighii Opera Omnia, folio, p. 19. London, 1687

† Ibid. p. 20. ‡ Ibid. p. 20.

Mr Nasmyth next describes the structure of the pulp. This he found to be composed of minute cells, presenting themselves in a vesicular form, and varying in size from the ten thousandth part of an inch to the eighth of an inch, and he discovered that they were evidently disposed in layers throughout the body of the pulp. When thin layers of macerated pulp were examined, they presented an irregular reticular appearance, and were found to be interspersed with granules. The parenchyma was traversed by vessels in a vertical direction. When the pulp was exposed, he was often astonished at the rapidity with which it diminishes in volume, and at the extent of that diminution, the pulp sometimes seeming to be almost annihilated. He accounts for this by supposing that the cells were filled with an aërial or watery fluid, whose escape allowed the cells to collapse, but he was unable to determine which it was. He, however, found this appearance constantly present on the surface of the pulp, which was in apposition with the ivory, and which was essentially concerned in its developement.

The formative surface of the pulp displayed a regular cellular arrangement, which he denominated reticular, and described as resembling a series of skeletons of desiccated leaves. The compartments were of an oval form, and overlapped one another in the pulp of the calf's tooth. When these leaves of reticulation were separated they were seen to be of a regular structure, with a well defined scolloped border, from which occasionally processes were observed to project at irregular intervals. On the surface of the pulp innumerable detached cells with central points were seen, which formed, in general, a regular complete coating, the central points being placed at intervals corresponding to the distance between the fibres. These points were rendered visible from the greater opacity of the intermediate material. When the pulp was removed for examination at an early stage, fragments of the dental bone or ivory were found adhering to it, and it was observed, that the size and form of the cells of these bony fragments always corresponded with those of the cells of the pulp. When one of the single reticular leaflets noticed above was removed and examined by the microscope, it was found that the process of ossification or deposition of bony matter within the cells took place from the centre towards the circumference, and blood-vessels were seen coursing along beneath the reticular formative surface. The whole appearance, indeed, denoted the existence of a peculiar system of cells external to the peripheral ramifications of the blood-vessels.

It appeared to Mr Nasmyth that the frame-work of the reticulations or cells of the pulp constituted the fibres of the teeth, but that whilst they were in this state they were spirally coiled and fitted into each other. At all events, the diameter of these fibres of reticulation was precisely the same as that of the ivory fibres; the only change which they appeared to undergo from the deposition of ossific matter within them being that they were "drawn out from the coiled up state in which they exist between the collapsed cells of the reticulations, into the more longitudinal but still spiral form in which they are found in the ivory." The convoluted fibre of the pulp appeared to be composed of single successive granules which were developed one after the other from the body of the pulp, until the fibre was complete. He could not discover the manner in which the osseous matter was deposited in the cells of the interfibrous substance; but the cells seemed to be divided into minute cellules, for they presented the appearance of being filled with granules in certain progressive stages of developement.

Mr Nasmyth does not explain how the laminæ are connected together so as to form a solid whole, nor how a partially spirally twisted longitudinal fibre can form a net-work or reticulation; and in his representation of a portion of the human ivory, showing the spirally twisted fibres, he has omitted to represent any, even the most distant, approach to reticulations or cells.

The cellular laminæ being in imbricated apposition, and held together, as he asserts, by earthy salts, and being arranged in layers conformably with the periphery of the pulp, ought to be regarded as concentrically laminated. This arrangement seems to Mr Nasmyth to explain more satisfactorily than any other view, the concentric fracture of the tusks of the mammoth, and of other teeth when left to decompose spontaneously, and also the phenomena daily noticed by ivory cutters, and Mr Hunter's experiments of feeding animals with madder. It may be recollected, that, from the very same facts, Hunter, Cuvier, and a host of others inferred that teeth were composed of concentric laminæ.

The conclusion he draws from all these facts is, that the formation of the ivory of the teeth "is plainly neither more nor less than a process of ossification; a view of it totally opposed to that which has been taken by previous inquirers into the formation of ivory."

Mr Nasmyth is not, however, correct in stating that his notion regarding the ossification of the pulp is a view totally opposed to that of all previous inquirers; for almost every writer, with the exception of Cuvier and his followers, describe the process of the formation of the tooth as a process of "ossification of the pulp;" and Malpighi, Monro, Hunter, Blake, Fox, Delabarre, Bell, &c.

regarded them as true bone. Raschkow and Purkinje described the pulp as consisting of a congeries of nearly uniform globules without vessels or nerves, but that afterwards vessels and nerves appeared, the globules became more regularly arranged, and assumed a long or drawn-out form. These drawn-out globules were evidently nothing else than cylindrical cells, and appeared very similar to the prisms of the enamel membrane. When the pulp of a young tooth was drawn out, a layer of cylindrical cells was seen on its surface. These were remarked to have the same thickness and course as the fibres of the ivory; in fact, these inquirers considered them to be but the fibres of the tooth in their first stage, and that they were merely changed into the latter by becoming filled with organic mater, becoming solid, and ossifying. They considered the dental substance to be simply *ossified pulp*. Schwann, the latest inquirer into this subject, previous to the reading of Mr Nasmyth's memoirs before the British Association, arrived at the same conclusion, regarding the pulp as cellular, and the dental substance to consist of the ossified pulp.

These facts speak for themselves, and serve to show, that in many cases the industry of preceding writers has left little for their successors beyond the task of corroborating, by new examination, the valuable facts recorded by these early investigators. If some have fallen into the error of supposing their own views original or new, this circumstance only shows how soon facts are lost in the accumulating mass of medical literature. At the same time, it must be allowed, that Mr Nasmyth, by prosecuting the same train of inquiry, has confirmed the results of previous authors, and has certainly added much to the precision and accuracy of our knowledge of the subject.

Mr Nasmyth's last memoir is entitled "Investigations into the Structure of the Epithelium;" and if he has not added many new facts, he has succeeded in authenticating many of the latest observations on this subject.

Since the days of Leeuwenhoeck the cuticle has been described as composed of minute scales; but it is to the investigations of Henle,* published in 1837, that the minute arrangement of that structure was first clearly pointed out. He described the epithelium as consisting of scales bearing the appearance of cells of an irregular form, but, when perfect, in general of a pentagonal form, with straight, or imperfect and lacerated margins, and containing each a central spot or nucleus. The nucleus had a smooth appearance, or was granular, was subrotund or oval, and often appeared to contain within it lesser granules, to which the name of nucleus corpuscules was afterwards applied. The nucleus was thicker than the cell or scale, so that it projected on each side. These cells appeared to be held together by means of a delicate net-work of some substance whose nature was not made out.

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* Symbolæ ad Anatomiam Villorum Intestinalium, &c. Comment. Acad. Berolini, 1837.

The epithelium of the mucous membrane he found to possess a somewhat similar form and arrangement. That of the mouth and œsophagus presented scales or cells of precisely the same appearance as those of the cuticle. At the cardiac orifice of the stomach, these cells disappeared, and were replaced by cylindrical bodies, but again appeared in the body of the stomach, and were finally lost at the pylorus; the whole of the remaining portion of the intestinal mucous membrane being covered by cylindrical or cuneiform bodies united by their sides, and fixed to the subjacent tissues by their apices. These cylinders had usually the central nucleus, and were connected together by a net-work of some unknown substance. In the air-passages the vibratory cilia were placed on analogous cylinders.

The cells of the cuticle when first formed were found to consist of little more than the central nucleus, but in course of time the outer envelope became distinct, and acquired a great increase of size, until its original form disappeared, and it became converted into a scale. The so-called *rete Malpighii* consisted of a similar structure, with this exception only, that the nuclei, which were of the same size as in other parts, occupied the whole cells.

Donné and Turpin* discovered the same structures in the genito-urinary passages; and Purkinje and Raschkow, Dr Sharpey,† Dr Madden,‡ Schwann, and others, have confirmed these observations. Schwann, indeed, is reported to have added many new facts, as that every nucleus contains a nucleus corpuscule, which is the first step of the formation of the cell; and that fibres may be distinctly traced in the gelatinous-looking elastic substance which stretches between the scales or cells. As we have not, however, seen his work, we are unable to give full details of his researches.

Raschkow, in 1835, added many interesting facts regarding the structure of that portion of the epithelium which covers the gums. He remarked that over what is commonly called the dental cartilage, a tolerably thick stratum of epithelium of the mucous membrane was found, consisting, like the epidermis of the skin, of regular polyedric scales, more regular than those of the skin, and placed one over the other, several of them presenting an orbicular spot in their centre. Under these scales was situate the hard parenchyma of the dental cartilage, corresponding to the chorion of the skin, inasmuch as it was granular, abundantly supplied with vessels, and interwoven with numerous, firm, and fibrous filaments. In the gum of the new-born infant closed cavities were constantly met with at intervals, filled with scales similar to those of which the epithelium was composed. These were the same as those which were described by Serres as glands for the deposition of tartar. It is more likely, however, that they were the follicles which Arnold described as existing in the gum of the infant, and which lead to the sacs of the incisor and canine teeth. In a calf of nine weeks, a double series of processes were observed lodged in corresponding cavities of the parenchyma of the gum. These were situate in the gum over the molar teeth, but they did not seem to penetrate into the cavities of the molars themselves, though at first they appeared to do so, but were evidently separated from them by the capsular membrane and enamel pulp.

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* Annales des Sciences Naturelles, 1837, p. 207.

† Sharpey, in Encyclopædia of Anatomy and Physiology. Art. Cilia.

‡ An Experimental Inquiry into the Physiology of Cutaneous Absorption. Edin. 1838.

Such appears to have been the extent of our knowledge when Mr Nasmyth in 1839 took up the subject. He also noticed the presence of the nucleus in most of the cells or scales, and that this part was first formed, and the cell or scale formed around it. He noticed, besides, the fibrous structure of the elastic gelatinous substance which intervened between the scales. He observed distinct granular bodies on the surface of this substance, which imparted to it rather a dense aspect. In some cases granules covered individual scales, but could be made to disappear by pressure. In the epithelium of the gum of the calf, he observed distinct fibres " which pass over the surface of the scales and connect them together, thus forming a very delicate net-work." This appearance was most remarked when the part was subjected to compression before being examined. Raschkow mentioned the disappearance of the granules on pressure; but Mr Nasmyth has been probably deceived in representing either them or the fibres as passing over the surface of the scale. This appearance was probably caused by the injury done to the tissue from the compression employed previous to its examination, and, indeed, both analogy and actual experiment seem to be against the supposition that any fibres whatever pass over the surface of the scales. The reticular structure has only been observed between the scales, and alongst with the granules filling up the intervening space.

The cuticle of the frog he found to be composed of minute scales, the bodies of which were held in direct apposition so as to form one lamina, which had a beautiful tessellated appearance, which, when thrown off when the animal changes its skin, is replaced by another lamina of the same nature.

It may be remarked that the same structure exists also in the whole classes of serpents, lizards, &c. When the cuticle becomes old, as it cannot be thrown off in scales like that of man and the mammalia, it is raised from the subjacent tissues by the growth of a new cuticle beneath it; and when this has acquired sufficient developement, and becomes so consolidated as to loosen the connections of the old cuticle to the living surface, it is cast off in a more or less solid mass.

Mr Nasmyth, in describing the epithelium of the gum, uses nearly the same words as Raschkow, and like him compares the vesicles or cavities noticed on it to the tartar glands described by Serres. He also describes what he calls larger vesicles deeply implanted in the mucous membrane of the fœtal gum, lined by a delicate membrane, and containing a fluid coagulable by heat, acid, or alcohol. In this fluid numerous globules and scales similar to those of the epithelium floated. It is more than probable that what Mr Nasmyth here describes as larger vesicles were nothing else than the dental capsules of the second set of teeth in their early stage of developement. This is rendered probable by their position, and also by their deep situation in the gum. He also notices the processes described by Raschkow as sinking into the gum, and describes them as being composed of "elongated scales connected together, and forming masses which divide and subdivide until they attain such extreme tenuity, that the most minute terminations consist but of two scales in marginal apposition."

A few remarks are made on the vitality of the epithelium, and as to "whether we are entitled to regard the epithelium and mucus as identical." The vitality of the epithelium has been long known, and the subject fully treated by numerous investigators, both in this country and on the continent; and with regard to the epithelium and mucus being identical, we know of no modern authorities for the support of such an exploded opinion.

Art. III.—*Practical Observations on Injuries of the Head.* By William Sharp, F. R. S., Senior Surgeon to the Bradford Infirmary, &c. &c. 8vo. London 1841. Pp. 168.

Mr Sharp states in his preface that he has been induced to publish the results of upwards of twenty years experience, in order that he might "contribute something, how small soever, to the treasury of physic;" and though he cannot be said to have contributed much to our stock of knowledge, his production may be regarded as a creditable summary of his views of affections of the brain produced by injury. It may be remarked that injuries of the Brain would have been a more appropriate title for his work than those of the Head, as his observations are limited solely to, 1*st*, Concussion of the Brain; 2*d*, Compression of the Brain; and 3*d*, Laceration of the Membranes and Wounds of the Brain.

Under the head of Concussion of the Brain, he not only includes concussion itself, but all those affections to which concussion may give rise; as inflammation of the brain or its membranes, softening of the brain, effusion of watery or purulent fluid between the membranes, within the ventricles, or in the substance of the brain. In treating the subject, however, he subdivides his cases of concussion into three classes. 1*st*, Those in which alarming symptoms arise immediately on receipt of the injury, and which speedily terminate in death or pass off altogether. This class corresponds to concussion. 2*d*, Those in which a few days elapse before violent symptoms come on. This section corresponding to the stage of inflammation. 3*d*, Those in which weeks or months elapse, the patient making only slight complaints, till symptoms of effusion of serous fluid, suppuration, or softening of the brain are manifested. This corresponding to the stage of effusion or softening.

Regarding the treatment, he is averse to the administration of cordials unless in extreme cases, where life seems on the point of departing; and he agrees with Sir B. Brodie in regarding the syncopal state as rather conducing to the patient's welfare. As the pulse rises and the powers of life are restored, he watches to prevent excessive reaction by the abstraction of blood. This, with rest, low diet, and aperients, usually suffice for the cases which come under his first class. Bleeding is the remedy chiefly to be trusted to in his second class, when symptoms of inflammation of the brain or its membranes come on, together with counter-irritation by blisters, croton-oil, sinapisms, &c. Regarding his third class, he remarks that it is generally very difficult to get the patient to submit to any treatment till too late, but he omits the detail of what the proper treatment would be if the individual should consent to submit himself to it. He cautions against mistaking the symptoms arising from over-depletion for those of inflammation of the brain, and quotes Sir B. Brodie's opinion thereon, where, alongst with the other symptoms indicative of that affection, a hard pulse is mentioned as one. Both surgeons and physicians are, however, now agreed, that a hard pulse never attends over-depletion; the pulse has a peculiar jerking beat, but is at the same time very compressible, diagnostic marks which distinguish the pulse of over-depletion from that of inflammation. It is also mentioned that opium is sometimes required to be given, but in what circumstances is nowhere stated.

After mentioning the usual symptoms by which compression may be distinguished from concussion, but, at the same time, noticing that it is frequently extremely difficult to diagnosticate between these two injuries, he divides the subject of compression into three heads, according as it is produced by extravasated blood, depressed bone, or effusion of serous or purulent fluid. The symptoms attending each of these varieties are succinctly stated, and a selection of interesting cases which came under the author's own observation are given in illustration. Some of these cases show how rapidly recovery may take place, under appropriate treatment, from formidable wounds, complicated with fracture and depression.

A short account is given of the opinions of a few of the leading surgeons, from Hippocrates to Sir B. Brodie, regarding the rules for the application of the trephine; and the conclusion the author arrives at is, that the scull ought not to be trepanned in cases of concussion, nor in cases of simple compression ofthe brain, nor in depression without fracture in children, nor in simple fractures or fissures with slight depression, but without alarming symptoms, nor even in compound fractures, provided there be no depression or alarming symptoms. But in all cases where matter or blood is expected to be met with beneath the scull, and in all cases of depression where there are serious symptoms of compression, the operation, he infers, ought to be performed. It is stated that it is still a disputed point whether a simple fracture, with deep depression, but without symptoms of compression, or a compound fracture with depression, but also without alarming symptoms, ought to be operated on. It may be remarked that the best modern surgeons answer these last queries in the negative; they never interfere, unless serious symptoms of compression are evidenced, and Mr Sharp mentions that such was his own practice. There is one variety of wounds of the head, in which almost every surgeon now recommends the trephine to be applied, which the author has omitted to mention, that is, in punctured wounds of the scull. Acute spiculated portions of bone being driven in by such a wound upon the membranes are liable to excite inflammation sooner or later, and as it is easier to prevent than to cure inflammation of the membranes when once induced, it is advisable in every case to cut out by the trephine the punctured spot. This part of the subject is concluded by giving a few useful directions regarding the best modes of applying the trephine and using the saws.

The author's last chapter is devoted to the consideration of wounds of the brain, and it is only to be regretted that he has not given a few more of his own cases instead of quoting those detailed by others. One of his own cases is rather interesting in a medico-legal point of view. It shows that a man, after the receipt of an extensive compound fracture of the scull, with loss of substance of the brain, had risen from bed, driven a cart nearly a quarter of a mile, emptied it of its contents, reloaded it, and then driven it some hundred yards to his own house, when he became faint, required to be assisted to bed, and died the second day thereafter. Had this man received these injuries in a scuffle, and yet done all he did do after their receipt, scarcely any evidence would have satisfied a jury that the injuries producing death had been received in that scuffle, it being so generally believed that an extensive injury of the brain like this would deprive the person of sensation and motion at the moment.

Regarding the treatment to be pursued in wounds of the brain, the author is extremely short. He, in general terms, recommends the splintered and depressed bones to be carefully removed, the integuments to be carefully replaced, the force of the circulation to be moderated by the repeated abstraction of blood, and the inflammatory symptoms to be subdued by every possible means.

In an appendix he gives an abstract of the fatal cases described by Morgagni and Pott. It would have been more for the interest of science that he had given a like abstract of those occurring in his own practice, or in the hospital under his care.

Art. IV.—*The Principles and Practice of Obstetric Medicine and Surgery in reference to the process of Parturition. With One Hundred Illustrations on Steel and Wood.* By Francis Ramsbotham, M.D., Member of the Royal College of Physicians; Consulting Physician in Obstetric cases to, and Lecturer on Obstetric and Forensic Medicine at, the London Hospital; Physician to the Royal Maternity Charity. London, 1841, 8vo, pp. 672.

Of the three first parts of this work we gave, at their first appearance, a short notice in our fifty-fourth volume. The work is now completed, and comes before us in a shape more favourable for forming a general and correct judgment.

The work of Dr Ramsbotham may be described as a complete system of the principles and practice of midwifery; and the author has been at very great pains, indeed, to present a just and useful view of the present state of obstetrical knowledge. The work is strictly confined to midwifery alone, and does not profess to go beyond the boundaries of that department.

The arrangement is simple and sufficiently clear and methodical.

Dr Ramsbotham describes, first, the anatomical peculiarities of the pelvis, and the relations between that and the fœtal head, the most important varieties of deformed pelvis, and the generative organs of the female, external and internal; and then gives an account of the gravid womb and its contents, and the changes which the organ undergoes in position, in direction, and in size, in consequence of impregnation, and a short but clear sketch of the development or progressive gravid enlargement of the organ.

He then enters on the history of the process of labour, which he ascribes entirely to the contractile powers of the muscular fibres of the uterus, and describes carefully the symptoms indicating the approach of that process, and those which show that it has commenced, and concludes with observations on spurious pains.

Labours he distinguishes into four classes; 1. Natural Labours; 2. Difficult or laborious Labours; 3. Preternatural Labours; and 4. Complex Labours. The second class he divides into two orders—Lingering Labours and Instrumental Labours. The third class, or what are commonly called cross-births, he distinguishes also into two orders, first, as the presentation is merely any other than the head, and secondly, as it is the transverse part of the trunk. The fourth class, or that of complex labours, Dr Ramsbotham distinguishes into ten orders, viz. labours complicated, 1. with dangerous hemorrhages; 2. with convulsions; 3. with rupture of the uterus; 4. with lacerated vagina; 5. with ruptured bladder; 6. with descent of the chord before the head or breech; 7. with descent of one or both hands, and the head or breech; 8. with syncope unconnected with uterine flooding; 9. those in which monsters are produced; and 10. labours complicated with plurality of children.

Dr Ramsbotham gives then a full description of the phenomena of natural labour, and the accidents liable to take place in it; and delivers very judicious rules for the management of the process, and conducting the after-treatment of the mother and the infant. He then considers the irregularities to which the head-presentation is liable, and illustrates them amply and at considerable length by figures.

The author next enters on the consideration of the second class, and gives a full view of the various forms, and the causes of lingering or tedious labours, whether these causes be referable to the structure of the parts of the mother, or to different unusual morbid or unnatural states of the ovum. Under this head, when speaking of treatment, the author considers the utility of the spurred rye, and forms a very just estimate of the merits of that drug. He further makes some very judicious observations on various practices supposed by some accoucheurs to facilitate and expedite delivery.

Under the second form of difficult and lingering labour, that namely, in which there is a want of adequate space at the outlet of the pelvis for the issue of the infant, the author considers the cases in which the Cæsarean section is applicable, and those in which craniotomy may be required. He then considers successively the difficulties and impediments caused by tumours in the pelvis, as exostosis, fibrous tumours of the uterus, enlarged ovary and similar growths, rigidity of the *os uteri*, cicatrix in the vagina, obliquity of the *os uteri*, and then the causes referable to the state of the ovum.

Then follows the subject of instrumental labours, which is considered at much length, and explained with great judgment as well as good feeling. Though all parts of the volume are ably written, this we would recommend to the particular and serious consideration of obstetrical practitioners, as one showing most perfect acquaintance with the subject, and dictated by the desire to cause as little suffering as the circumstances possibly admit.

We have often expressed our opinion upon this subject, and recommended to obstetrical practitioners, that the passion for having recourse to instruments ought to be moderated and abated; and it gives us pleasure to observe a practitioner of the judgment and experience of Dr Ramsbotham, pursuing the course which he does in the present volume. It is probable that a general amelioration in this department of obstetrical science has taken place. It is probable that practitioners, after being better acquainted with the powers of nature, are more disposed to rely on them in situations in which the aid of instruments would have been employed, and that, consequently, the assistance of these means is less generally sought. We are nevertheless inclined to believe that, with many persons, ambitious of displaying the rules of art and artificial means on all occasions, and with many country practitioners, penurious and niggardly in the bestowal of time, instruments are employed much more frequently than there is any good occasion for them being employed.

Hear what Dr Ramsbotham says:

"I would not have it thought by these observations that I am unable to appreciate the advantages sometimes resulting from instrumental aid; or that I would drawn an argument against a valuable measure from the possibility of its abuse. I know too well that nature sometimes fails even in her grandest and proudest work—the continuance of the human species; and that occasionally both the mother and her offspring would be overwhelmed in one common fate, unless art stepped in to snatch them from impending destruction. But I would endeavour deeply to impress upon the mind of the young practitioner that urgent necessity alone will warrant him in taking an obstetric instrument in hand; and that when a choice is allowed him, he should leave nature to accomplish her own purpose,—provided, indeed, he can with safety trust her.

> "In his practice he will find it much more difficult to determine the time when instrumental aid may have become necessary, than to administer that aid; and, unfortunately, he will find the most deadly means most easy of application. Many times, also, he may be almost persuaded against his own opinion to the adoption of those means by the urgent and unceasing solicitations of his patient. I would entreat him neither to allow these considerations to weigh with his judgment, nor to let that less worthy motive, a wish to take advantage of the *éclat* likely to result from a successful operation, tempt him to act contrary to his own feelings of propriety."—Pp. 284–285.

It must not be imagined, nevertheless, that it is practicable in all cases of obstetrical practice, to banish entirely the use of instrumental assistance. Cases will, and must occur, in which neither delivery can be accomplished nor the life of the mother saved without such interposition. It is against the use, not the abuse, and against the ordinary not the extraordinary application of these mechanical means that we argue. A just medium ought to be observed between unseasonable aversion to the use of instruments, and the constant or even frequent employment of them. On this point, Dr Ramsbotham adopts the middle course, and expresses himself in the following manner.

> "We must take these recommendations of Hunter, Osborn, and Denman, however, with some limitation, and recollect that they lived at an age when instrumental interference was frequently had recourse to unnecessarily; that nature was seldom or never allowed to accomplish her object; but the hand was constantly thrust into the vagina and uterus, to dilate the parts;—instruments were employed to extract the child; and the rudest means were used to bring away the placenta. A most beneficial object, then, was gained by the recommendations of these great men, and the strong language in which they clothed their instructions: a great revolution was gradually effected in the practice of the age, and obstetricians were taught to rely more implicitly on the powers and beneficence of nature. But however useful it might have been during the lapse of the last century to paint in glowing colours the dangers of instrumental interference, and the all-sufficient agency of nature, the cautions then inculcated are fortunately, in a great measure, uncalled for at the present time."—Pp. 306–307.

There is good reason to believe, that, by the timely use of the forceps, many a tedious labour might be safely shortened, and the life of many an infant, destroyed by apoplexy in the uterus and passages, might be saved.

Dr Ramsbotham further considers very attentively the respective merits of the different sorts of instruments, and decides in favour of each with much judgment. After considering the comparative advantages of the vectis and the forceps, he is disposed to give the preference in the majority of cases to the latter. The conclusion is stated in the following manner:—

"These three principal advantages, then, of the forceps—the being able to turn the head in any direction,—their producing compression and diminution of bulk, without bruising the soft parts, and the comparative safety with which they may be employed—induce me to use them, and strongly recommend them, in preference to the vectis. There are only three cases in which I think the latter instrument preferable; under presentations of the brow, face, or side of the head—the ear, for example. In brow presentations, the instrument may sometimes be advantageously used—being passed over the occiput—to bring down the vertex, and prevent the case being converted into a face presentation; but this is seldom requisite, and can only be effected before impaction has occurred; and where the face presents, and the head has become impacted in the pelvis, the case is more likely to be easily terminated by the adaptation of the vectis, than by the forceps; and the same remark holds good in regard to presentations of the side of the head." —Pp. 323–324.

This fillet he unconditionally condemns as an unscientific and dangerous contrivance.

The author directs attention afterwards to the use of the long forceps, and explains the circumstances requiring their application, and also the mode of applying the instrument; and he shows, though he is most careful to impress the necessity of using the instrument with all the requisite cautions, and, above all, without employing force, that he is decidedly favourable to their employment in those cases in which it is necessary to employ instrumental means for promoting, aiding, or accomplishing delivery.

The following observations show that the author has most carefully considered the cautions required in the application of the instrument, and that he is quite aware of the dangers to which its use exposes the patient.

"*Cautions.*—There are some cautions necessary in the use of the long forceps, from which the shorter kind are exempt; they principally are—*First*, that we should not apply them in a case where great distortion exists. It has been already laid down as a general principle, more than once, that, unless the pelvis possess, in its conjugate diameter, three inches of clear available space, we cannot expect a full-grown well-ossified head to pass entire; and through such a diminished aperture we are not to hope that we shall be able to extract it by the forceps. Burns, indeed, fixes the limit of the deformity which would indicate the use of the long forceps at that space. Davis, from the observations he has given us, would lead us to believe that rather more was generally required than that which Burns specifies; and I am inclined to think that, unless the pelvis measures at least three inches and a-quarter, we shall generally be foiled in our attempts at delivery;—or, at least, be disappointed in our hope of extracting the child living.

"*Secondly*—In introducing each blade, we must be particularly careful that the point slides within the *os uteri*, and does not run up between the vagina and the neck of the womb, lest we should bruise or lacerate that organ at its junction with the vagina; and especially, lest, in attempting to lock the blades, we should pinch its structure between their extremities and the child's head. This mischance cannot happen with the short forceps, because the *os uteri* must be entirely dilated before their application; and, when the longer pair is used, may be avoided by taking care that the point is constantly kept in contact with the fœtal cranium, guided by two fingers previously inserted.

" *Thirdly*—That we should not employ any strenuous endeavours for effecting delivery, nor work with them for too long a period continuously. The longer the instrument, the greater leverage we possess; and it must be evident that each increase of leverage augments our power; we are not only, therefore, liable to use too much exertion; but we run the risk of making pressure upon structures less capable of sustaining it uninjured, than when we employ the short forceps. Unless, then, a decided advance be evident after a few minutes well-directed efforts, we should desist from renewing our attempts; and we must judge of the progress we are making, by examining after each backward and forward movement of the instrument. We must most scrupulously avoid using forcible means. Force, indeed, is a word which should be expunged from the vocabulary of obstetrical phrases.

" *Fourthly*—We must be guarded in our promises regarding terminating the labour by the means we are about to resort to; because it is impossible that we can measure the head accurately while its base remains above the brim, and it is equally impossible that we should be able to form an opinion of the degree of ossification it has acquired, and of its compressibility. In all these points we may be deceived, although we may have made ourselves acquainted with the capacity of the pelvis to the greatest nicety; and while such chances of deception exist, we must be most cautious not to add disappointment to suffering. I have myself, in some instances, been foiled in attempting to extract the head entire through a narrowed aperture, and been obliged, eventually, to have recourse to the perforator. I always feel more satisfied, however, in lessening the head after having made these attempts, because I have good reason to think that nature unassisted would seldom be able to expel a child through a pelvis of such small dimensions as would not admit its passage by the aid of the long forceps;—provided, in other respects, the case was fitted for the employment of that instrument. I would advise the operator, then, before proceeding to act, not to make a promise of delivery, but merely to state that he is about to do something which will most probably relieve the patient materially, and that, *perhaps*, he may at once terminate the labour.

" After all I have said on this subject, I must not close my remarks without coinciding in opinion with Professor Davis, that the instrument, although very powerful and valuable, is at the same time very dangerous in its use; that it should not be taken in hand except by those who have acquired some proficiency in operative midwifery; and that it is to be had recourse to, more as an experimental measure for superseding the necessity of destroying the child, than as one of the common resources of our art."—Pp. 337, 339

Then follows the consideration of craniotomy, on which Dr Ramsbotham makes many judicious observations, suggested equally by good feeling and knowledge of the subject. To these we must simply, though strongly, refer all obstetrical practitioners, especially when they are actuated by a fondness for the use of instruments, and a taste for operations. Next follows the Cæsarean section, the operation of Sigault or the division of the *symphysis pubis*, the question of controlling the growth of the fœtus *in utero*, and that of the induction of premature labour. On all these topics, Dr Ramsbotham gives very ample and correct information, and information which could be furnished only by one who has devoted his life to the subject,—who is most thoroughly conversant with all its practical details,—and who has considered all the difficulties and the most effectual means of surmounting them.

The subject of unnatural presentations comes next under consideration, and is very ably and amply illustrated in all its varieties, by well-executed figures. Under this head, the author considers various dangerous accidents with which labour is liable to be complicated, as hemorrhage and its effects, retention of the placenta, adhesion of the placenta, puerperal convulsions, rupture of the uterus, laceration of the vagina, rupture of the bladder, prolapsus of the chord, and the expulsion of monstrous births.

On all these subjects, Dr Ramsbotham has shown himself very well-informed, and communicates his instruction in an agreeable manner.

In giving an account of this volume we have, in some measure, lost sight of the circumstance, that it is a work principally of illustrations; and this has mainly resulted from the fact, that the descriptive parts are so ably performed, that our attention has been attracted to them as forcibly as to the delineations. We must not forget to say, however, that the illustrations are numerous, well selected, and appropriate, and engraved with great accuracy and ability. In short, we regard this work, between accurate descriptions, and judicious directions and instructions, and useful illustrations, as by far the most able work on the principles and practice of midwifery, that has appeared for a long time. Dr Ramsbotham has contrived to infuse a larger proportion of common sense, and plain unpretending practical knowledge into his work, than is commonly found in works on this subject; and as such, we have great pleasure in recommending it most strongly to the attention of obstetrical practitioners.

PART III.

MEDICAL INTELLIGENCE.

ANATOMY AND PHYSIOLOGY.

Additional Facts regarding the Structure of the Liver. By M. **Ernest Lambron.** (*Archives Generales de Medecine,* January 1841.)—The researches of M. Lambron, relative to the intimate structure of the liver, were noticed in the 145th number of this Journal, in October 1840. Since then, M. Lambron has extended his researches, and in the present paper has explained his views more fully.

When the liver was injected from the *vena portæ,* and the injection arrived at the minute ramifications of that vessel, it was seen at certain points to run between the granulations, and even to surround them completely. If the injection was pushed a little further, it surrounded all the hepatic lobules, and exhibited at the surface of the liver an infinity of small polygonal figures, more or less regular. If the injection was pushed still further, it penetrated the granulations of the liver, and coloured them from their circumference to their centre, and then returned by the sub-hepatic veins.

When the injection is pushed through the subhepatic veins, and arrives at the surface of the liver, it is under the form of small points in the centre of all the granulations; then are seen to appear small stellated vessels with two, three, or four branches, according as the lobule has two, three, or four angles. When the injection is pushed further, it penetrates the granules, and colours them, but in an inverse order from what it does when injected from the *vena portæ,* that is, it colours them first in their centre, then at their circumference. After this, it circumscribes the lobules, and returns by the *vena portæ.* No matter how long the injection be pushed, it always passed by the *vena portæ,* and never by any of the other vessels of the liver. When a blue injection was carefully thrown through the *vena portæ,* and a red injection simultaneously pushed through the sub-hepatic veins, the two could be so managed as to make both arrive the length of the granulations, and colour the central part red, the circumference blue.

Injection by the hepatic artery coloured the liver very slightly, and the liquid was poured into the branches of the *vena portæ,* which, by continuing the injection it filled, and passed through, circumscribing the lobules, penetrating the granulations from the circumference towards their centre, and, finally, passing out by the sub-hepatic veins. From this circumstance, M. Lambron concludes that the blood in the hepatic artery does not contribute to the secretion of bile, until it has become venous, and has amalgamated with that in the *vena portæ.*

When an injection is pushed through the biliary canals, it circulates between all the granulations of the liver, and circumscribes them as in the injection from the *vena portæ,* with this difference, however, that the excretory canals do not form, like the veins, plexuses around the lobules. Though the biliary canals have no communication with the blood-vessels, they have a very free one with the lymphatic vessels, and injection pushed through the biliary vessels passes always into the lymphatics long before it has arrived at the extremity of the excretory canals. This easy communication between the lymphatics and the biliary vessels explains, Mr Lambron thinks, the reason why jaundice may suddenly appear from any cause which produces a stoppage at the excretory biliary ducts; the secreted bile is rapidly taken up by the lymphatics, and thrown into the general circulation. It also explains why the cellules or terminal extremities of the biliary tubes are almost never found dilated with bile in cases where the *ductus communis-choledochus* has been obliterated. The bile, in such cases, had been removed by the lymphatic vessels. The injection pushed through the biliary tubes never communicated with or made its way into the blood-vessels.

The circumstance of the two injections not commingling, shows that they are separated from each other by distinct membranes, and from their form, M. Lambron designates them pouches, cellules, or utricules. It is into the inter-utricular intervals that the injection spreads, which is pushed through the *vena portæ*, as it passes through the last subdivisions of this vessel into those of the sub-hepatic veins, which are situated in the centre of the granulation. As to the mode by which the biliary conduit terminates in the granulation, M. Lambron says that he has never seen but a single biliary conduit going to each lobule; that this conduit penetrates the granulation on one of its surfaces, and after a short course, seems to terminate in a cellule; and he thinks that all the cellules communicate with one another.

M. Lambron concludes that the hepatic granulation is covered on all sides by a species of capsule or prolongation of the capsule of Glisson. By the centre of its base, an intralobular vein enters, which spreads itself over the interior of the granulation, and sends small branches in the direction of the angles of this glandular grain. The granulation is composed of a multitude of minute polyædral cells ranged more or less regularly around the intralobular vein. The hepatic granulation, then, is of itself a liver in miniature.

On the Regeneration and Union of Nerves. By MM. GUNTHER and SCHON. (*Archives Generales de Medecine*, March 1841.) Rabbits were the animals on which the following observations were made, and about fifty of these were operated on, by sometimes only cutting across the ischiatic nerves, at other times by removing a portion varying from two to four lines in length. These physiologists describe the elementary fibres of the nerves as transparent cylinders with double tunics, filled with a fluid resembling liquid albumen. After maceration in water, or after death, this fluid coagulates and produces the turbid granular aspect which, till now, has been considered its natural appearance. When the two extremities of a nerve which has been cut across become united, the nerve propagates impression through the uniting medium. This is done by means of true primary fibres having been formed through the uniting medium, and the following is the mode in which MM. Gunther and Schon have observed this to take place. After division of the nerve the two ends retract somewhat, the diameter of the neurilema becomes diminished, and the medullary substance is pushed out in a globular form; exudation of plastic lymph then occurs and fills the wound, and the cut extremities of the nerve become swollen, the upper extremity more than the lower. This tumefaction of the nerve itself is owing to the presence of plastic lymph effused into the cellular tissue and also between the neurilema and primitive fibres.

The matter which unites the two ends of the nerve is at first amorphous, but by degrees primitive fibres shoot through the mass, and become visible at the earliest on the eighth week after the division. These new fibres are in every respect similar to the original fibres; but the granular exudation and the cellular tissue which surround and envelope them render them difficult of examination. These fibres are not parallel, but exhibit a confused arrangement.

With the regeneration of the fibres of the nerve returns the sensibility and mobility of the limb or organs to which the nerve was distributed.

But in general the function of the part is not so free as before the division;—the animals not being able to use the limb whose nerve had been divided so freely as the other. The influence of the will over the limb was also observed to be diminished. MM. Gunther and Schon account for this on the supposition, which is borne out by their experiments, that the number of fibres which is regenerated is not equal to those which originally existed; besides it appeared to them that the regenerated fibres occasionally united the ends of different primitive fibres, so that sensation was not always referred to its proper place. They consider that the regeneration or growth of the uniting fibre commenced at the superior extremity of the divided nerve, but concede that it is possible that it may also take place from the lower extremity.

Experimental Researches on the Function of the Skin in man and animals. By Dr Ducros. (*Comptes Rendus des Seances de l'Academie des Sciences*, 20th September 1841.)—In a very curious experimental paper Dr Ducros shows that a coating of gum-lac put on the skins of animals causes them to die in a longer or shorter time, by producing convulsive movements similar to epilepsy. When the animals, coated with gum-lac, were subjected to electricity, they died in a much shorter time. He next tried the effect of metallic coverings, as he entertained the notion that, because they had opposite electrical properties, the animals coated with them would die with symptoms of an opposite nature. He therefore cut off the hair from some animals and covered them with thin plates of tin, (tin-foil) and found that they perished with symptoms of debility, the reverse of what he had noticed when the coating consisted of a resinous substance. When the tin was covered with a coating of gum-lac, the animals perished still more rapidly. He then placed under the influence of electricity some of the animals covered with plates of tin, and found that, so long as they remained connected with the electrical current, their vigour appeared to be restored, but that, whenever it was arrested, they appeared ready to perish.

The object of these experiments was to ascertain what would be the likely effect of such coverings in certain diseased states of the human frame, and especially in nervous or neuralgic affections, and in rheumatism. He reasoned, that, if metallic coverings deprived animals of life by producing rapid sinking of the vital powers, the same metallic plates applied to the human body would cure or remove those diseases which seemed to depend on an excess of organic life. On putting his plan to the test of practice, he was so fortunate as to find that it removed some nervous, and a few acute and chronic rheumatic affections.

This plan of treatment was of no avail in any case where the disease was dependent on or connected with organic lesions, or attended with fever, or swelling of the part, or with general weakness; on the contrary, in all these cases the metallic plates augmented the disorder.

PATHOLOGICAL CHEMISTRY.

Of the State in which Urea exists in the Urine. By MM. Cap and Henry. (*Archives Generales de Medecine*, August 1841.)—These chemists some time ago asserted that urea exists in the urine in combination with lactic, and perhaps also phosphoric acids; but this circumstance was denied by M. Lecanu. They therefore repeated their experiments, and arrived at the conclusion, that their former statement was correct. They evaporated urine at a low temperature to dryness, and mixed the residue with twelve times its weight of a fluid composed of two parts of sulphuric ether and one of alcohol. After a few days the etherial solution was filtered and evaporated, saturated with a slight excess of an alkaline carbonate, again filtered, and, on exposure to a gentle heat, fine prismatic crystals of lactate of urea were obtained, in every respect identical with those obtained by the direct combination of urea with lactic acid.

Mode of Preventing the formation of Gouty Concretions. By ALEXANDER URE, M. D. (*Medico-Chirurgical Transactions,* Vol. xxiv. 1841.)—The urate of soda, which forms the chief bulk of gouty concretions, being an extremely insoluble salt, Dr Ure thought that if any means could be devised, so to modify the secretion of urates so as either to render them soluble, or to supersede them altogether, these concretions might be prevented from forming. In the course of his researches, he found that hippuric acid combined with soda, which he regarded as the analogue of gouty concretions, occurred in the urine of graminivorous animals. This salt is extremely soluble, two parts of water at 60° dissolving one part of it. Dr Ure then ascertained by repeated experiment on himself and others, that the one salt might be substituted for the other in the human body, without any risk of affecting the general health or of irritating the urinary organs. This was accomplished by administering internally the benzoic acid an hour after a meal, when he found that the urine voided a couple of hours afterwards gave, on the additon of muriatic acid, a copious precipitate of beautiful rose-pink acicular crystals of hippuric acid. The quantity procured in this way was, in general, equivalent by atomic computation to half of the benzoic acid employed, so that the remainder of that acid must have made its escape by some other emunctory. The same result was obtained when the hippurates of potash or of ammonia were used, and he thinks it would often be found preferable to employ them instead of the simple acid. The dose could easily be apportioned to the state of the urinary secretion, previously ascertained by experiment. Thus, by a process of vital chemistry, an acid containing 8 atoms of azote and 10 of carbon, is replaced by one containing 18 of carbon and only 2 of azote, and that too in what has been regarded as a highly azotized state of the system.

Mr Ure has not yet ascertained how far this plan of treatment is applicable to all the various forms of calculous diseases connected with a gouty diathesis; but he has not found it to interfere with the other remedial means; and unequivocal proofs, he says, have been already afforded him, of its efficacy in correcting and removing certain disordered states of the urine in individuals prone to attacks of gravel.

On the composition of the urine during Pregnancy and Disease. By M. DONNE. (*Comptes Rendus de l'Academie des Sciences,* 24th May 1841.) M. Donné found that during pregnancy the urine possesses less uric acid and phosphate of lime than during the ordinary state of the body; a circumstance which it is easy to account for, seeing that these elements are required for the formation of the bones of the fœtus. The crystallization of the salts of the urine is then modified in such a remarkable manner that M. Donné has been able, by the inspection of them alone, to ascertain the existence of pregnancy in no fewer than thirty cases.

When a person is in good health, the urine contains iron; but during chlorosis iron is not to be detected by the usual reagents, but it may again be recognized if ferruginous preparations are administered. In certain forms of chlorosis he found that the urine contains iron, and in such cases ferruginous preparations are useless as a means of cure. The examination of the urine is, therefore, of considerable importance in all such cases. It is stated that we never can be sure that the chlorotic affection is permanently removed, unless we ascertain by an examination of the urine several days after the ferruginous preparations are omitted, that iron is still passed off with it.

In typhoid fever the crystals of the urine presented a rayed aspect, and a pearly lustre, something like crystals of the phosphate of ammonia. The same appearance was observed during pneumonia.

M. Donné mentions that he has injected milk into the serous cavities of dogs, and also into the veins, which, provided it was pure, gave rise to no bad symptom, but circulated in the vessels like blood.

MEDICAL PATHOLOGY AND THERAPEUTICS.

Case of Recovery from Tubular Pregnancy by the artificial production of Abortion. By Professor Ritgen. (*Gazette Medicale de Paris*, 8th May 1841.)—A woman who had born three children began to complain in the month of May 1834 of pains in the lower part of the abdomen on the right side in the situation of the ovary. She soon felt a small tumour in this region, which, from the size of a citron, in six weeks acquired that of a child's head. The pain stretched up the back, and down the right thigh, and became every day more insufferable, so as, at least, to deprive her of sleep. Fever, constipation, slight jaundice, and general dropsy were gradually induced. She believed herself to be again in the family-way, both from the menstrual secretion having been stopped for eleven weeks, and from feeling those peculiar sensations she had experienced in her former pregnancies. Professor Ritgen discovered that the lower part of the uterus was somewhat enlarged, that the orifice was directed to the left side, and that a tumour was in close contact with the upper part of the uterus, and was moveable. After a careful examination of it, both from the vagina and the rectum, but especially from examining it by means of the stethoscope, and hearing distinctly the *bruit de soufflet*, he arrived at the conclusion that it was a tubular pregnancy. He, therefore, with the view of aborting it in its early stage, together with the use of enemas, prescribed first Glauber's salts, and afterwards pills composed of the ergot of rye and extract of aloes, covered the lower part of the abdomen with cataplasms, and put a seton in the neighbourhood. Vomiting was first excited, then followed contractions of the uterus and of the tumour; black blood flowed from the vagina, at first sparingly, but afterwards in larger quantity, and mixed with clots and shreds, resembling portions of the fœtal membranes. By the fourth day after this, the tumour was found to have diminished considerably in size, and the pain was greatly abated; but a year and a-half elapsed before it completely disappeared. Blood was discharged from the vagina for nearly nine months. She has not again become pregnant.

Spontaneous Gangrene of the Penis. By Dr A. C. Post. (*New-York Journal of Medicine and Surgery*, January 1841.)—A farmer, 31 years of age, who had suffered much from malarial fever, but never had syphilis, nor had been in the habit of eating rye bread, observed a black painful spot appear, without obvious cause, on the penis, thirteen days before his admission into the Hospital. This gradually increased in size till it involved the whole extremity of the penis in all its thickness, when a line of demarcation was formed, and the sloughed part dropped off about a week after his admission.

Œdema of the Arm alternating with the state of the Menstrual Discharge. By Dr A. C. Post. (*New-York Journal of Medicine and Surgery*, January 1841.)—A woman got her right arm very much chilled, and put it into warm water to recover its temperature. This was followed by swelling of the arm, inability to bend the elbow joint, and cessation of the menstrual secretion, which had been regular before. Various means had been used for the last three years to remove this remarkable swelling of the arm, but every thing failed to give relief. She had only menstruated three times during that period, and on these occasions the swelling almost entirely disappeared. At all other times there was increase of the pain and swelling, on the approach of the menstrual period. Under Dr Post's treatment, the menstrual discharge became more regular, and the œdema had almost completely disappeared.

On the Nature and Treatment of that form of Scarlatina connected with cerebral symptoms. By T. F. CORNELL. (*New-York Journal of Medicine and Surgery,* January and April 1841.)—The variety of scarlatina to which Dr Cornell in particular adverts, is that which has been usually denominated the malignant form, though most of his remarks apply equally to that usually regarded as the inflammatory variety. He considers affection of the brain to be the prominent symptom of these forms, and proposes to call those in which such a modification occurs, by the term of *scarlatina encephalica,* and thinks that this state is the result of a deficiency of nervous energy, and not of the presence of inflammatory action. That the cerebral symptoms usually observed depend on diminished vital energy, and especially of that of the brain, he thinks is proved by the fact, that the pulse is always weak and very frequent, that the skin is either much exalted in temperature, or, if the typhoid symptoms be very severe, is cold; and there is constantly present delirium, either violent, or low and muttering, or instead, there is only somnolency or drowsiness alternating with delirium. The effect of bleeding in aggravating all these symptoms, and inducing a fatal result, contrasted with the rapid amelioration of all the symptoms resulting from the free use of stimulants, he considers prove his statements.

Considering scarlatina as a disease produced by the absorption of a poison which depresses the vital powers, he freely administers stimuli, and the result of his practice appears to have been most satisfactory, especially when contrasted with the very great mortality experienced by many practitioners, when they meet with the disease in a violent epidemic form. His practice in all cases of scarlatina was exceedingly simple. In the milder forms the cure was chiefly left to nature. In the more severe, wine-whey, made of two parts hot milk and one part Madeira or sherry wine, was given in greater or less quantity, in proportion to the severity of the symptoms. As the typhoid symptoms diminished, arrow-root or water-gruel was added, and beef-tea or chicken-broth succeeded these. Magnesia or castor-oil was given to regulate the bowels. If the throat was ulcerated it was touched with a solution of the nitrate of silver, and if aphthæ were present, the carbonate of iron, with the occasional addition of quinine, was administered internally. The tumefactions in the throat were removed by the external application of the tincture of iodine and soap liniment, in the proportion of a drachm and a-half of the former to one ounce of the latter; the rheumatic pains by warmth and gentle frictions. Sinapisms in general succeeded in removing the affections of the chest. The suppression of urine and the dropsical symptoms disappeared under the persevering use of stimuli, and very rarely appeared in those who were thus treated from the beginning. After Dr Cornell adopted the above treatment, he found the most virulent cases of the disease yield in from six to nine days, by which time his little patients were often out of bed, and he had discontinued his attendance.

Remarks on the Tape-Worm. By Professor WAWRUCH of Vienna. (*Medicinische Jahrbucher des Oesterreichischen Staates.* Feb. 1841.)—Professor Wawruch has, during the last twenty years, had an opportunity of treating no fewer than 206 cases of persons affected with tape-worm, and as it falls to the lot of very few indeed, to see anything like this number of cases, his observations on the causes, symptoms, and treatment, are highly valuable.

He remarks that 71 cases occurred in males, and 135 in females. 22 were below 15 years of age, one only 3½; but the disease was most frequent in those from 15 to 40 years of age. In one only the age was 54. The disease occurred chiefly among the lower classes residing on the banks of the Danube, in low damp habitations, and the causes which favoured the production of scrofula seemed also to give a predisposition to tape-worm.

Gastric and cutaneous affections, but especially gastric and intermittent fevers, seemed to precede the appearance of tenia in most cases; but other diseases, such as chlorosis, syphilis, scurvy, which are remarked to have a weakening influence on the digestive organs, were also observed to be followed by tape-worm. Almost all those who had tape-worm were subject to lumbrici in their youth. He does not think that this is a hereditary disease; two instances alone having come under his notice, of parent and child being at the same time affected with the disease.

The diet which seemed especially to favour the generation of tape-worm, was bad bread, farinaceous articles of food, milk, butter, cheese, potatoes, pork, mutton, and bad water.

In most cases, the females affected with tape-worm had their menstrual secretions disordered, and were suffering in consequence.

The duration of the disease was from a few months to many years; cases having come under his notice where the disease lasted from ten to thirty-five years.

The *Botriocephalus* occurred in only three cases out of the 206 cases of tape-worm; the *Tænia solium* in all the rest.

The symptoms which attended the presence of tape-worm were very various, but those which appeared most constantly were the following:—Dull pain in the forehead, dizziness, and ringing in the ears; indistinct and troubled vision, in one case periodic day-blindness; eyes surrounded with a dark or blue circle; œdema of the upper eyelid; dilated pupils, frequent and involuntary spasms of the eyes. The colour of the countenance often changed; the lips were ash-coloured, and a particular appearance existed around the mouth and nose; sometimes they had a cachectic appearance, at other times they appeared to be in robust health. Anorexy, alternating with an appetite so voracious that if they did not get somewhat to satisfy the unnatural craving for food they almost fainted; cravings for particular kinds of food were also remarked. Fetid breath, a loaded tongue, salivation, and efforts to vomit, with pruritus of the nose, anus, &c. grinding of the teeth, palpitations, and general uneasiness were frequent symptoms. The belly was swollen, and a gurgling sound was heard; there was present a feeling of constriction or pricking around the umbilicus; and the undulatory movements of a foreign body were felt in the intestines in the morning; but these sensations were relieved by the ingestion of food, or by drinking warm coffee or milk.

When the disease has lasted for a long time, and the persons are of an irritable constitution, a train of nervous symptoms make their appearance, as melancholia, lipothymia, frightful dreams, general or partial convulsions, St Vitus's dance, epilepsy, aphonia, &c. But the most certain pathognomonic sign of the presence of tænia is the passing of one or more joints of the animal, which occurs spontaneously, or after severe attacks of disease, as scarlatina, typhoid fevers, &c., or after the use of certain articles of food, as cucumbers, garlic, radish, &c. The joints of the tænia are most generally thrown off at a determinate period, for the most part at the waning of the moon, or at the new moon, at which time there is an exacerbation of all the symptoms. The joints of the tape-worm are either passed alone, or alongst with the stools; they generally exhibit signs of life, and the larger the number of joints, the longer do they continue to live.

The whole 206 cases were treated alike; but no cure was ever attempted, so long as there existed a decidedly cachectic state, chronic inflammation of the intestines, chronic diarrhœa, hæmorrhoids, or pregnancy; and the treatment was always deferred in females till six days after the menstrual period. The patients were subjected to a preparatory treatment which Professor Wawruch considered indispensable in all. He therefore gave them daily for three or four days a simple demulcent decoction, with sal ammoniac, and confined their diet to beef-tea three times a day. In eight cases, this rigid diet sufficed to expel the tape-worm. The evening before the proper treatment commenced, he administered to his patient a dose of fat soup without salt, and after that an enema, which was repeated the next day, but not immediately after the soup or the anthelmintics. These consist of two ounces of castor oil, which is taken during the day in divided doses, alternated with the powdered root of the male fern, in the dose of from fifteeen to thirty grains. To aid the passage of the worm into the large intestines, an enema with oil or milk was administered after every dose of oil and fern-root. The tape-worm was always more sure to be expelled when a drastic purgative composed of equal parts of calomel, gamboge, and sugar, two to eight grains of each, was given. It was frequently necessary to repeat this dose from three to six times before the worm was expelled. In a few cases, strong doses of the drastic purgative had no effect in evacuating the bowels, in which case the sulphate of potash generally succeeded.

When the tape-worm was expelled in a mass, the whole animal appeared to come away, as no medicines afterwards administered brought away even a single joint; and in all those who had taken the male-fern powder, the worm was found torn in pieces, even the single joints were broken up. The periods at which the worm was expelled varied. Thus eight were expelled in consequence of the preparatory regimen; 13 by the anthelmintics; 11 by the first dose of the drastic purgative; 14 by the second dose; and 15 by the third, and, in general, between the first and second hour after the administration of the drastic purgative. In some cases it was the second, third, and fourth day before the worm was expelled, and in one only it was the twelfth day. The morbid symptoms disappeared so rapidly after the expulsion of the tape-worm, that the patients generally quitted the hospital the second day thereafter.

Of the 206 patients, in 20 the complaint returned a second time; in five, a third time; and in one, a fourth time, at periods of time, varying from one month to two years. Of the 206 patients, 151 were cured; 17 were not subjected to any treatment; the occurrence of unfavourable symptoms caused the treatment to be suddenly stopped in 19; in 13 the remedies were administered during full moon and failed; and in 6 there existed lumbrici. It is mentioned as a curious fact, that when lumbrici existed in the intestinal tube, the treatment had no effect on the tæniæ, but expelled the lumbrici alone.

Case of Complete Paralysis of the Seventh Pair of Nerves. By Dr C. James. (*Gazette Medicale de Paris*, 18th September 1841.)—A young woman, 22 years of age, was seized with paralysis of the left side of the face, involving all those parts which are supplied by the seventh pair of nerves. The features were distorted and drawn towards the right side. She had no command over the motions of the left side of the face, eye-brow or eyelid. The upper lip of this side hung relaxed, and the lower was equally paralyzed in its left half, and hung forwards, giving issue to the saliva.

Galvanism was employed for the cure of this affection. One needle was fixed in the parotid gland, and the other was successively placed in the supra-orbitar, infra-orbitar, and mental foramen, and a stream of galvanism from Clark's galvanometer passed through and along the diseased nerves. Instead of relieving, the galvanism appeared to aggravate the affection, for by the sixth sitting, the right side of the face became equally affected with the left, and she gradually but completely, lost the power of modulating the features, moving the lips, eye-lids, or eye-brows.

At this stage of the affection her features appeared quite regular, but immovable, and quite incapable of expressing any of the emotions of the mind. The eyelids were wide open, exposing a greater portion of the globe of the eye, and she could not close them. The eye-brows hung relaxed over the eyes. The nostrils were relaxed, and during forcible inspirations were pressed by the air against the septum, so as to act as valves and prevent the access of air to the lungs. The lips hung quite relaxed, and her speech was very indistinct, from the impossibility of articulating the labial letters. At every respiratory movement the lips were blown out or carried in against the teeth, according to the direction of the current of air. The cheeks were relaxed and pendant. Mastication was very troublesome, for the food got between the relaxed cheeks and gums, and required to be pushed between the teeth by means of the fingers.

Three days after the paralysis was complete on both sides, by the continuance of the galvanism, symptoms of amendment were visible, the features began to be drawn to the left, or first affected side; and in ten days after the paralytic affection of that side was almost completely removed. It was not, however, till sixteen days after this that the paralysis was removed entirely from the right side of the face also, and the patient was declared cured. The patient had thirty applications of the galvanism before the cure was effected. A few more sittings were, however, given, in order to prevent a relapse.

Ileus cured by a Belladonna Enema. By Dr Becker. (*Gazette Medicale de Paris,* May 8th 1841.)—A woman, 48 years of age, was suddenly seized with vomiting, pain in the bowels, and constipation. The vomiting became more and more fetid, and at last stercoraceous, and after five days treatment was worse than ever. M. Becker then gave her an enema made with one drachm of the root of belladonna, which, within a very short time after its administration, put a stop to the pain and vomiting, and in half-an-hour brought away a stool containing much blood. After this, the woman gradually recovered. No narcotic effects were observed from the employment of the belladonna.

On the Nitrate of Potash as a cure for Acute Rheumatism. By M. Arran. (*Journal des Connaissances Medico-Chirurgicales,* April 1841.)—The administration of the nitrate of potash for the cure of acute rheumatism, a remedy which in England holds a considerable reputation, has been revived in the Parisian hospitals, and apparently with great success. In M. Arran's paper, twelve cases are related, three of which were complicated by rheumatic endocarditis or pericarditis, and in all, a cure was effected by the nitrate of potash alone. Two of these cases suffered a relapse, but the same means sufficed to produce a cure. The mode of administration consisted in dissolving from two to five drachms of the nitrate of potash in about a pint and a-half of some ptisane, sweetened to suit the taste of the individual, and this quantity was taken in the course of the day. The quantity was daily increased. The average quantity of nitrate taken daily by each patient was a little more than eight drachms in about four and a-half pints of fluid. The cures were effected within eight days, on an average of the twelve cases related. The administration of this remedy caused copious perspirations, sometimes also free alvine evacuations, less frequently increased flow of urine. The pulse diminished in frequency and hardness, and the impulse of the heart was lessened. The nitrate was given with safety in every period of the disease, but was found to be most successful when administered shortly after its invasion. The only contraindication to the use of the remedy was the existence of inflammatory affections of the stomach or intestines. If gastric symptoms should arise during the administration of the nitrate, it ought to be stopped, and depletive measures used till these subsided.

On the occurrence of Nephritis with Albuminous Urine in Infants. By Dr Charcelay. (*Gazette Medicale de Paris*, 25th September 1841.)—Dr Charcelay describes at length sixteen cases of a disease attended with œdema, and occurring in infants shortly after birth, which he attributes to nephritis. No particular symptoms are mentioned diagnostic of this affection, excepting the œdematous state of the body, and the urine being albuminous, as he calls it. The substance, however, which he designates albumen would appear not to be such as he mentions, that, though a precipitate was occasioned by nitric acid, it was soluble in an excess of the same. The kidneys were found to be the seat of vascular engorgement, and were larger and redder than usual. A cretaceous looking matter, of a reddish-yellow colour, which he thought was lithic acid, was found in large quantity in the calices of the kidneys.

Periodical Epilepsy cured by Arsenic. By Dr Macdonald. (*New York Journal of Medicine and Surgery*, January 1841.)—A seaman, 21 years of age, had been subject to epileptic fits, which occurred regularly twice every day, and had resisted all the more ordinary means of cure. Quinine had been also administered on account of the periodicity, but was of no avail. Fowler's solution of arsenic was then given in the dose of four drops three times a day. In three days the fits were postponed and were also slighter: at the end of other three days he had a very violent fit, after which they did not return for a whole week. The extraction of a tooth at this period brought on a slight paroxysm, but after this he had none for nine days, when the remedy was discontinued, on which they returned; but ceased again as soon as it was resumed.

On the beneficial effects of Narcotism in Neuralgic diseases. By M. Levrat, Sen. (*Bulletin de l'Academie Royale de Medecine*, June 1841.) M. Levrat relates the history of several cases of obstinate neuralgic affections, which had resisted a long and varied treatment, but at length yielded, and rapidly too, to the use of narcotics, carried the length of producing narcotism. He thinks the practice is perfectly safe in the hands of a careful and intelligent physician. One or two cases will suffice to illustrate his practice.

1. A sister of charity at Lyons, from the fatigues of her service, had become affected with severe sciatica; the limb wasted away, and had lost a third of its volume. All the usual means failed. Opium was then given so as to induce narcotism, when almost immediately the pain ceased, and, by the end of a month, the same treatment had completely removed the affection.

2. Madame Faure, sixty-two years of age, had suffered with sciatica for three years. Three grains of opium were required to produce narcotism and she recovered in about the same time as the above case.

3. M. Moretti suffered many years from sciatica of the left limb, which was much atrophied. All remedies had failed to relieve the excruciating pain. Two grains of extract of opium produced poisonous symptoms with narcotism, vertigo, nausea, &c. requiring bleeding and other remedies. When he recovered, his malady was gone, and two years afterwards he was still well.

4. A woman, forty-two years of age, was afflicted for many years with nervous asthma; she recovered from the first day she took a pill composed of extract of opium, and extract of belladonna.

SURGICAL THERAPEUTICS.

On a safe mode of removing foreign bodies from the Knee-joint. By Dr Goyrand. (*Annales de Chirurgie Francaise et Etrangere*, April 1841.)—Dr Goyrand's mode of operating is a modification of the subcutaneous method as originally proposed by MM. Dufresse-Chaissaigne, and Dr Guerin. The foreign body is brought to the upper and outer angle of the articular cavity and held fixed there. A small incision is made with a narrow bistoury through the skin at a little distance from this point, and the knife is pushed forward below the skin till it comes in contact with the synovial membrane over the foreign body, which it incises to a sufficient extent to allow the foreign body to escape into the subcutaneous cellular membrane. The external wound is then healed up, and this generally is completed within twenty-four hours or so. Time is then allowed for the internal wound to heal; and after eleven or twelve days a simple incision is made over the foreign body, and it is extracted. M. Goyrand adds, that when the foreign body in its new situation gives rise to no inconvenience, it appears to be unnecessary to interfere with it. The danger of opening the joint is by this mode of operating completely avoided; and what was formerly one of the most dangerous operations is by this means rendered both a simple and a safe one.

Successful case of Amputation at the Hip-joint. By M. Textor. (*Gazette Medicale de Paris*, 4th Sept. 1841.)—A man was seized with gangrene of the leg, for which the limb was amputated through the knee-joint. The gangrene, however, seized the stump, and M. Textor was obliged to amputate the thigh at the hip-joint. The only unusual occurrence noticed during the time of the operation was, that the crural artery was plugged up with a fibrinous clot, notwithstanding which a ligature was passed around it. No unfavourable symptom followed; and four months after the operation the man had so far recovered his health as to be able to walk about the court of the hospital.

Two cases of Excision of the Callus in badly united Fractures. By Professor Portal. (*Gazette Medicale de Paris*, 18th September 1841.)—A man, 32 years of age, fell from a cart and fractured his tibia and fibula nearly in their middle. Inflammation, followed by purulent infiltration, attacked the limb, and as the patient was very restless, after the cure was effected, it was found that the fragments of the bone had united in an irregular angular manner. Professor Portal first tried to break the callus across, in order to reset the limb, but, not succeeding in this, he cut down on the irregular angular projection by a vertical incision, and uncovering the bones, passed a chain saw round them and removed about an inch of the bone. The wound united by the first intention; the limb was kept carefully extended, and in forty-eight days the patient was dismissed cured. The limb was shortened a very little.

The other case was that of a woman who had received a compound fracture of the upper third of the thigh bone. On account of the violence of the inflammation the limb was at first semiflexed, and when this had abated it was placed in the extended posture. After a period of twenty-eight days the bandage was removed, and it was found that the union had taken place irregularly, the broken ends forming an angle at their union. As it was found impossible to rupture the callus which had been thrown out, the ends of the bone were cut down on, a chain saw passed first around the upper fragment and about an inch and a-half removed, and then around the lower, and half-an inch of it cut off. The limb was then maintained in a state of permanent extension. The wound suppurated and became covered with an eschar, but no other unfavourable symptoms followed; and fifty-five days after the operation she was dismissed cured, with the limb shortened to the extent of two finger-breadths, but perfectly serviceable.

Inguinal Hernia cured by the Subcutaneous Section. By M. GUERIN.—(*Bulletin de l'Academie Royale de Medecine*, September 1841.)—M. Guerin exhibited to the Academy a man whom he had cured of an old inguinal hernia, by means of the subcutaneous section of the abdominal aperture of the inguinal canal. In this case there was a double scrotal hernia; that on the left being about the size of a goose-egg, that on the right somewhat smaller. The largest had existed for about twenty, the smaller for about seventeen years. They were both reducible. The operation was alone performed on the right side. The patient was laid on his back, with his legs separated and knees bent, and the hernia was reduced. The skin was then drawn up in a transverse fold from the bend of the thigh and base of the scrotum, till on a level with the external inguinal aperture, when a fine pointed bistoury was introduced into the entrance of the canal above and inside of the spermatic cord, which an assistant held as much as possible to one side. Into this aperture a convex probe-pointed myotome, three-quarters of an inch long and about the same broad, was introduced into the canal its whole depth, and incisions were made all round the canal, carefully avoiding the cord. The incisions were made about a quarter of an inch deep, but he also scarified the internal surface of the canal. The patient lost about a cup of blood. When the air and blood were expelled from the wound, the external incision was carefully dressed, and compresses were applied over the course of the canal. Not a single unpleasant symptom followed. Lymph was apparently thrown out at the incised part; by the fifteenth day after the operation, this had acquired firmness and a fibrous consistence to the feel. On the twenty-first day the patient was allowed to rise, but the bandage was still kept on. No pain nor swelling appeared on coughing, though that on the opposite side, which had not been operated on, immediately appeared. He returned to his employment, and at the end of five weeks from the date of the operation, gave up wearing the bandage, and the hernia has not returned; the inguinal canal appeared to be obliterated.

ETIOLOGY.

Cases of Asphyxia produced by the common Light Gas of Strasbourg. By Professor TOURDES. (*Gazette Medicale de Strasbourg*, August 1841.)—A family, consisting of six persons, retired to their home on the evening of the 31st December 1840, and not making their appearance either the next day or the second day thereafter, the neighbours broke open their doors at half-past ten of the 2d of January. Five of the family were found stretched apparently lifeless on the floor, and the sixth on the bed. The father, 46 years of age, gave some signs of life; the mother, 44 years of age, uttered a few groans; the servant, 18 years of age, was dead, cold, and stiff; two boys of 14 and 15, were also cold and dead; the daughter, 5 years of age, was still warm. All means were used for their resuscitation, but the father died next day, and the mother alone recovered.

A strong smell of gas was felt when the doors were first opened, and there was no other apparent cause for the fatal asphyxia of the family.

The bodies were opened, and presented a marked similarity in the morbid appearances. In all, rose-coloured patches were noticed on the anterior and internal part of the thighs, and the dermoid and subcellular structures below these spots were found highly injected with blood. The membranes of the brain were injected with blood in all, as was also the substance of the brain itself, and especially its outer surface, which had a deep red tinge in consequence. In the father this was less remarked, as he had been freely bled several times. Clotted blood was found effused into the spinal canal between the membrane and bone.

In those who had fallen victims to the deleterious gas before being seen, a viscid whitish foam with bloody streaks through it filled the mouth, larynx, and bronchii, and adhered to the membrane. The pulmonary tissue was throughout of a bright-red colour. The blood was of a black colour, coagulated, and accumulated not only in the heart but also in the aorta and chief veins. The liver was of a decided red hue, from its whole structure being gorged with blood in four of them, but it was pale and of a yellowish gray in the fifth. In four of them the bladder was distended with an enormous quantity of limpid urine. The cadaveric rigidity was well marked in all.

These morbid appearances present not the slightest similarity to those observed in two cases of asphyxia from the same cause, by Mr Teale, and published in the eighth number of Guy's Hospital Reports, and in the 141st number of this Journal, p. 576. They resemble much more the cases of asphyxia resulting from the breathing of carbonic acid vapours, or the vapours arising from burning charcoal or coal; indeed, the appearances correspond very closely with those detailed by Dr Golding Bird, in a paper on "Poisoning by the Vapours of Burning Charcoal and Coals," published by him in the same number of Guy's Hospital Reports, an extract of which is also given in the 141st number of this Journal.

On the Influence of Professions and Localities on the production of Pulmonary Consumption and Scrophula. By M. FOURCAULT. (*Comptes Rendus de l'Academie des Sciences,* 31st May 1841.) M. Fourcault imagines that most of the diseases which prove slowly fatal to man do so by their action on the functions of the skin, preventing or modifying the process of elimination; that, in fact, chronic diseases are owing to disease of the fluids. Phthisis, he remarks, is most common in large towns, and in persons of a sedentary profession, carrying off a fifth of the population. The mortality from this disease is much less in villages which do not contain above 2000 inhabitants, and which are in an elevated and dry situation. With these favourable circumstances phthisis scarcely carries off more than a fortieth of the population; and in villages, still less densely peopled, it does not appear to prove fatal to more than from a sixtieth to a hundredth.

Rouen is situated in a marshy soil, is surrounded by hills, and the air is habitually humid; a fourth of the patients in the hospitals die of consumption. The sailors, and the dyers who work on the banks of a neighbouring small stream, are rarely attacked with it. Havre, a town very near Rouen, but situated on the shore of the sea, and where there is a free circulation of air, is nearly exempt from the disease.

The coal miners of Belgium are not subject to phthisis, and this appears at first sight to be a contradiction to the above assertion; but their immunity is to be attributed to the mild temperature in which they live, to the regular exercise they are obliged to take, and to the system of ventilation carried on in the pits. If they remain, however, a long time at their occupation, they are attacked with rickets, deformities of the bones, &c.

At Lille, all the diseases proper to low humid valleys are met with, viz. rickets, scrophula, phthisis. The hospital includes children who have passed the earliest years of their existence in the country. In it their occupations vary according to their sex; the girls have sedentary occupations within the establishment; the boys work out of doors. What is the consequence? The boys preserve their health; but the girls are cut off in great numbers by mesenteric disease, chlorosis, scrophula, and spine disease.

The practical conclusions which the author draws from these facts are, that, to prevent the developement of phthisis, scrophula, rickets, &c. we ought to avoid sedentary professions for those individuals who are threatened with these diseases; and that walking and gymnastic exercises, horse riding, active occupation, dancing, and expeditions to the country, ought to constitute a part of the education of the young in all colleges or seminaries of learning.

TOXICOLOGY.

Coffee an antidote in poisoning by Morphia. By Dr B. Fosgate. (*American Journal of the Medical Sciences,* January 1841.)—To relieve himself of a severe attack of toothache, Dr Fosgate swallowed in solution one and a quarter grain of the sulphate of morphia, equal to about seven and a half grains of solid opium. In about half an hour, a sensation of thickening and rigidity of the muscles of the back of the neck came on, and gradually extended itself to all the flexors of the limbs. In about five hours severe nausea succeeded, accompanied by efforts to vomit. Tea and sour cider increased the efforts to vomit so much that the stomach rejected fluids the moment they reached it, so that a second mouthful could not be swallowed before the first was ejected. Prostration of strength and apathy, with full slow pulse, and pricking sensation of the skin, were added to the other symptoms which were continually increasing in severity, when coffee was proposed. One gill of cold strong infusion of coffee was swallowed, and was retained about five minutes; the distressing symptoms, however, were by it abated, the nausea in part subsided, as was also the sensation of rigidity of the muscles; and the occasional repetition of this simple remedy during the course of the night completely removed all the distressing symptoms. Dr Fosgate states, that, whilst suffering from the severe nausea, but previous to the exhibition of the coffee, his mind was depressed, and he felt considerable anxiety, no pleasurable sensations or reveries having been felt. But after the draughts of coffee, the depression of mind and all anxiety vanished, and there succeeded that exquisite revelling of the imagination so much sought after by the opium eater. This state continued for five or six hours, and was succeeded by sound sleep, on awaking from which he experienced a few hours lassitude. The morphia had been taken after eighteen hours fasting.

MEDICAL POLICE.

Regulations by the Royal College of Surgeons, London, regarding the education of Candidates for their Diploma.—The council of the college, desirous of furnishing to the public a correct list of their members, request that each member will be pleased to transmit to the secretary, between the 1st of June and 1st of July in every year, by letter, a statement containing his name at full length, address and date of diploma, in his own handwriting, in order that it may be compared with the chronological list.

The council will be further obliged by the member stating it in a similar manner when he has a degree in medicine, or the licence of the Society of Apothecaries.

The council will be glad to receive corresponding statements from the members of the Edinburgh or Dublin College of Surgeons, practising in England or Wales.—Edmund Belfour, Secretary.—*April* 8, 1841.

All students of anatomy and surgery attending hospital practice or lectures in London, and proposing to be candidates for the Diploma, are required to register at the college during the last ten days of January, April and October, the several tickets for lectures and hospital practice to which they shall have respectively entered:—and no certificates will be recognized by the court of examiners unless they shall correspond with such registrations.—(By order,) Edmund Belfour, Secretary.—*April* 13, 1840.

Registration of Members.—The president and council in publishing the corrected list of the members of the present year, with the date of each diploma, regret that so many members have omitted to make the return during the months of June and July, according to the form proposed by the council. They are anxious to explain to the members that the object of this annual registration is to furnish the judges, magistrates, clerks of the peace, Poor Law Commissioners, boards of guardians, and the public generally, with a correct list of qualified surgeons, in order to prevent the various impositions which have been practised upon them, by ignorant pretenders and other unqualified persons.

The names of all members who shall not have registered themselves previously to the months of July 1842 and 1843, will be omitted in the corrected list of the latter year.

The president and council particularly wish to intimate to all public functionaries, that no diploma can be genuine, in which there is any erasure, interlineation, or other alteration.

Regulations of the Council respecting the professional Education of Candidates for the diploma, 20th August 1839, amended October 14, 1841.

I. Candidates will be required, in addition to a certificate of being not less than twenty-one years of age, to bring proof

1. Of having been engaged in the acquirement of professional knowledge for not less than four years; during which period they must have studied practical pharmacy for six months, and have attended one year on the practice of physic, and three years on the practice of surgery, at a recognised hospital or hospitals in the united kingdom *:—three months being allowed for a vacation in each year.

2. Of having studied anatomy and physiology, by attendance on lectures and demonstrations, and by dissections, during three anatomical seasons or sessions, extending from October to April inclusive.

3. Of having attended at least two courses of lectures on the principles and practice of surgery, delivered in two distinct periods or seasons, each course comprising not less than seventy lectures:—And one course, of not fewer than seventy lectures, on each of the following subjects, viz. the practice of physic—chemistry—materia medica—and midwifery with practical instruction.

II. Members and licentiates in surgery of any legally constituted college of surgeons in the united kingdom, and graduates in surgery of any university requiring residence to obtain degrees, will be admitted for examination on producing their diploma, licence, or degree, together with proofs of being twenty-one years of age, and of having been occupied at least four years in the acquirement of professional knowledge.

III. Graduates in medicine of any legally constituted college or university requiring residence to obtain degrees, will be admitted for examination on adducing, together with their diploma or degree, proof of having completed the anatomical and surgical education required by the foregoing regulations, either at the school of the university, where they shall have graduated, or at a recognized school or schools in the united kingdom.

IV. Certificates will not be recognized from any hospital unless the surgeons thereto be members of one of the legally constituted colleges of surgeons in the united kingdom; nor from any school of anatomy, physiology, or midwifery, unless the respective teachers be members of some legally constituted college of physicians or surgeons in the united kingdom; nor from any school of surgery, unless the respective teachers be members of some legally constituted college of surgeons in the united kingdom.

V. Certificates will not be received on more than one branch of science from one and the same lecturer: but anatomy and physiology—demonstrations and dissections—will be respectively considered as one branch of science.

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* By a resolution of the council, on the 7th of November 1839, no provincial hospital will in future be recognized by this college which contains fewer than 100 patients, and no metropolitan hospital which contains fewer than 150 patients.

VI. Certificates will not be received from candidates for the diploma who have studied in London, unless they shall have registered their tickets at the college as required, by the regulations, during the last ten days of January, April, and October in each year:—nor from candidates who have studied elsewhere, unless their names regularly appear in the registers, transmitted from their respective schools.

N. B. In the certificates of attendance on hospital practice and on lectures, it is required that the dates of commencement and termination be clearly expressed, and no interlineation, erasure, or alteration will be allowed.

Blank forms of the required certificates may be obtained on application to the secretary, to whom they must be delivered properly filled up, ten days before the candidate can be admitted to examination; and all such certificates are retained at the college.

Museum.—The museum is open to the members of the college, and to the trustees of the Hunterian collection, and to visitors introduced by them personally, or by written orders stating their names; which orders are not transferable; on the public days, which are Mondays, Tuesdays, Wednesdays, and Thursdays; from twelve to four o'clock except during the month of September, when the museum is closed.

The museum is open on public days to all fellows and licentiates of the Royal College of Physicians in London, to Peers and Members of Parliament, to the great officers of state, and of the royal household and their immediate deputies; to all the dignitaries of the church and of the law, to all general and flag officers, to the members of all the learned and scientific bodies in the united kingdom, to the members of all the public boards, and to persons introduced personally by them respectively. And to all respectable foreigners, and to the articled students of the college; on entering their names and ranks or stations in the book provided for that purpose.

Lastly, the secretary and conservators will exercise their judgment in giving admission to any respectably dressed persons, who may apply for it.

The museum will be open on Fridays to gentlemen desirous of studying in it, from twelve to four in winter, and from twelve to five in summer, on their making a written application to the president or museum committee.

The senior conservator, Mr Clift, will attend every day on the visitors and students, and both the conservators, Messrs Clift and Owen, on Saturdays from ten to one, on which day, visitors and students desirous of comparing specimens with those in the museum, or of having specimens examined, or of gaining other information, are requested to present themselves.

Library.—The library is open daily, Sundays excepted, to members, and articled students of the college, from ten until four o'clock, from the 1st of October to the 1st of April; and from the 1st of April to the 1st of September, from ten until half-past five o'clock.

Members have the privilege of personally introducing a visitor.

Persons, not members, desirous of admission, must make application, in writing, to the president or library committee, specifying their Christian and surnames, rank or profession, and residence.

Tickets of admission are granted for six months, at the expiration of which time application must be made for their renewal.

Readers, taking extracts from any book, may not lay the paper on which they write on any part of such book; nor may any tracings be taken from any plate without the permission of the committee.

Books belonging to the college are not to be written upon; and any one observing a defect in a book is requested to report the same to the librarian.

Readers desirous of consulting works not in the library are requested to communicate their wishes in writing to the librarian, in order that the same may be reported to the committee.

The admission tickets are not transferable.

Every person upon admission to the library is required to insert his name and address in a book provided for that purpose.

Readers wishing to refer to any book are requested to furnish the librarian with the title or number thereof written on a slip of paper; and to return such book to the librarian before quitting the library.

Transactions.—The council proposing to publish, in the course of the ensuing year, a volume, to be entitled "Transactions of the Royal College of Surgeons in London," invite from the members of the college and other scientific persons, communications relating to the improvement of anatomical and surgical science.

The subjects proposed to be included in this publications are specified in the following extract from the ordinances of the college:—

"The Transactions shall consist of

Original Communications on surgical subjects.

Collegial and Jacksonian Prize Dissertations, deemed of sufficient originality and merit.

Original Memoirs on Human Anatomy.

Original Memoirs on Comparative Anatomy.

Anatomical Monographs of rare animals, dissected in the museum of the college.

Explanations of, and Commentaries on, important Preparations in the Museum, with illustrative plates.

Statistical Reports from hospitals."

It is requested that papers intended for publication in this volume may be transmitted to the president, at the college, on or before the 1st of May 1842.

Studentships in Anatomy.—Ordinances.—1. Three studentships in human and comparative anatomy shall be instituted; to be held by each student for the term of three years, at a salary of L. 100 per annum.

2. Candidates shall be members of the college, under twenty-six years of age.

3. The council shall determine annually whether one or more of such appointments shall take place during the current year; and shall notify its resolution by public advertisement.

4. The appointment shall be made in the month of June, or as soon after as possible.

5. The students shall be subject to such duties and restrictions as the council shall from time to time direct: and in case of misconduct shall be liable to dismissal.

Regulations—1. A report shall be made to the council in the month of March of the number of vacancies, or expected vacancies, in these studentships: whereupon the council shall determine whether any, and what number, of such vacancies shall be filled up, and shall direct the necessary advertisements.

2. Candidates shall transmit to the secretary, on or before the 1st of May, their applications for the appointment, together with certificates of general good character and of fair acquirements in general learning, signed by two qualified members of the medical profession.

3. A meeting of the museum committee shall be held as soon after the 1st of May as conveniently may be, at which the applications of persons offering themselves shall be examined, and if approved, they shall be admitted as candidates.

4. The museum committee shall determine the mode of ascertaining the merits of the several candidates, and shall, after due investigation, report to the council which of the candidates in their opinion possesses the highest merit.

5. Students shall attend in the museum daily (Sundays excepted) from ten till four o'clock, and shall be entirely under the direction of the conservators, who shall employ them as they shall see fit: and who shall have the power of granting leave of absence when they think proper.

6. In case of misconduct or neglect, the students shall be liable to be dismissed at any time by the president and vice-presidents, who are to report such dismissal, with the grounds thereof, to the next meeting of the council.

The president and council have great pleasure in announcing that, at the instance of the Director-general of the Medical Department of the Army, the Physician-General of the Royal Navy, and the Chairman of the Honourable East India Company; the General Commanding the Army in Chief, the Lords Commissioners of the Admiralty and the Court of Directors, have, with the view of promoting the objects of the college, been pleased to place at the disposal of the president and Council an assistant surgeoncy in each service, once in three years, for such of the said students as may be considered worthy of these honourable distinctions.

The subject of the Collegial Triennial Prize of fify guineas, is the Structure and Functions of the Lungs. The subjects of the Jacksonian Prizes of twenty guineas each, for the next year, 1842, *are the Comparative value of the Preparations of Mercury and Iodine in the treatment of Syphilis; and Injuries and Morbid Affections of the axillary Bones, including those of the Antrum. These Prizes to be written for under the following conditions:*

Candidates to be members of the college, not of the council.

The dissertations to be in English, and to be distinguished by a motto or device, accompanied by a sealed paper containing the name and residence of the author, and having on the outside a motto or device, corresponding with that on the dissertation.

Recited cases to be placed in an appendix.

Dissertations for the Jacksonian Prizes to be addressed to the secretary, and delivered at the college before Christmas day, 1842.

Dissertations for the Collegial Anatomical Prize to be also addressed to the Secretary, and delivered at the College before Christmas day, 1842.

The prize dissertations, with every accompanying drawing and preparation, will become the property of the college: the other dissertations, and other corresponding sealed papers, will be returned upon authenticated application within the period of three years; after which the papers containing the names of the respective authors will be burned, unopened, and the manuscripts will become the property of the college.

Copy of a clause.—In—" An act for consolidating and amending the laws relating to the building, repairing, and regulating certain Gaols and Houses of Correction in England and Wales."—" 4th George the IVth, cap. 64. [10 *July* 1823.]"—" XXXIII. And be it further enacted,—That the justices in general or quarter sessions assembled, shall and they are hereby required from time to time to appoint a surgeon, being a member of one of the Royal College of Surgeons, to each of the prisons within their jurisdiction to which this act shall extend; and every such surgeon shall and is hereby required to visit every prison to which he shall be so appointed twice at least in every week, and oftener if necessary, and to see every prisoner confined therein, whether criminal or debtor, and to report to every general or quarter sessions the condition of the prison, and the state of health of the prisoners under his care; and he shall further keep a Journal, in which he shall enter the date of every attendance on the performance of the duty, with any observations which may occur to him in the execution thereof, and shall sign the same with his name; and such Journal shall be kept in the prison, but shall regularly be laid before the justices for their inspection at every quarter sessions, and shall be signed by the chairman of the sessions, in proof of the same having been there produced; and shall and may be lawful for the justices, at every quarter sessions after such appointment, to direct a reasonable sum to be paid as salary to such surgeon, and also such sums of money as shall be due for medicines and other articles for the sick."

Extract of a clause of the act of 6th George the IVth, cap. 50. exempting persons from serving on Juries or Inquests.—Provided always, and be it further enacted,—That all surgeons being members of one of the Royal Colleges of Surgeons in London, Edinburgh, or Dublin, and actually practising, shall be and are hereby absolutely freed and exempted from serving upon any juries or inquests whatsoever, and shall not be inserted in the lists to be prepared by virtue of this act as herein after-mentioned.

MISCELLANEOUS.

MEDICO-CHIRURGICAL SOCIETY OF EDINBURGH.—On Wednesday, December 1st, the following gentlemen were elected office-bearers of the society:—

President.—David Maclagan, M. D.

Vice-Presidents.—W. Brown, Esq., John Gardner, M. D., J. Y. Simpson, M. D.

Council.—Dr J. S. Combe, Dr W. H. Thomson, Dr Patrick Newbigging, Dr W. Henderson, Dr John Moir, James Miller, Esq., John Goodsir, Esq.

Treasurer.—Dr Omond.

Secretaries.—Dr Douglas Maclagan, Dr James Duncan.

We regret to have to announce the decease of Dr Davis, in his 64th year, lately Professor of Midwifery in University College, London. This appointment he resigned some weeks previous to his death. Dr Davis was the author of various works on obstetric medicine, and was a man of considerable talent, much learning, and a great deal of industry.

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THE

EDINBURGH MEDICAL AND SURGICAL JOURNAL.

No. CLI.

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ERRATA IN DR STRATTON'S PAPER, VOL. LV.

Page 350, line 24, *for* Ereen, *read* Green.
—— 351, —— 31, *for* 2°, *read* —2°.
———— —— 33, *for* 5, *read* —5.
———— —— 34, *for* 10, *read* —10.
———— —— 35, *for* 23° *read* —23.
—— 352, —— 22, *for* Samia, *read* Sarnia.

NOTICES TO CORRESPONDENTS.

Communications have been received from Dr HOLLAND, Dr R. GILL, Dr KINNIS, and Mr EWART.

The following Publications have been received :—

Researches tending to prove the nonvascularity and the peculiar uniform mode of Organization and Nutrition of certain Animal Tissues, viz. Articular Cartilage, and the Cartilage of the different Classes of Fibro-Cartilage, the Cornea, the Crystalline Lens, and the Vitreous Humor ; and the Epidermoid Appendages. By Joseph Toynbee, Esq. M. R. C. Surgeons. London, 1841. 4to. Pp. 23. (From Philosophical Transactions.)

On the Nervous Ganglia of the Uterus. By Robert Lee, M. D., F. R. S. London, 1841. 4to. Pp. 6. (From Philosophical Transactions.)

A Treatise on Dislocations and Fractures of the Joints. By Sir Astley Cooper, Bart. F. R. S., Sergeant-Surgeon to the King, &c. A new Edition, much enlarged. Edited by Bransby B. Cooper, F. R. S., Surgeon to Guy's Hospital. London, 1842. 8vo. Pp. 576.

Catalogue of the Preparations illustrative of Normal, Abnormal, and Morbid Structure, Human and Comparative, constituting the Anatomical Museum of George Langstaff, Member of the Royal College of Surgeons, &c. &c. London, 1842. 8vo. Pp. 518.

An Inquiry into the Nature and Pathology of Granular Disease of the Kidney, and its mode of action in producing Albuminous Urine. By George Robinson. London, 1842. 8vo. Pp. 79.

The Administration of Medical Relief to the Poor, under the Poor-Law Amendment Act, and other Legislative Provisions for the Public Health. Considered in the Reports of the Poor-Law Committee of the Provincial Medical and Surgical Association. To which are appended Certain Clauses suggested for insertion in the Contemplated Bill for the further Amendment of the Poor-Laws. London, 1842. 8vo. Pp. 136.

Second Annual Report of the Crichton Institution for Lunatics. Dumfries, 11th November 1841. 8vo. Pp. 30.

The Employment of the Microscope in Medical Studies. A Lecture Introductory to a Course of Histiology. By John Hughes Bennett, M. D. Lecturer on Clinical Medicine, &c. Edinburgh, 1841. 8vo. Pp. 27.

On the Treatment of Stone in the Bladder by Medicinal and Mechanical means. By R. Willis, M. D. of the Royal College of Physicians. 8vo. Pp. 183. London, 1842.

Hydropathy, or the Cold-Water-Cure, as Practised by Vincent Priessnitz at Graefenberg, Silesia, Austria. By R. T. Claridge, Esq. Member of the Arcadian Academy, Rome. London, 1842. 8vo. Pp. 318.

A Practical Treatise on the Venereal Disease; or Critical and Experimental Researches on Inoculation, applied to the Study of these Affections, with a Therapeutic Summary and Special Formulary. By Ph. Ricord, M.D. Surgeon of the Venereal Hospital of Paris, Clinical Professor of Special Pathology, &c. &c. Translated from the French by Henry Pilkington Drummond, M. D. 8vo. Pp. 384. London, 1842.

Lectures on the Diseases of the Urinary Organs. By Sir Benjamin Collins Brodie, Bart. F. R. S., Sergeant-Surgeon to the Queen. 3d Edition, with Alterations and Additions. London, 1842. 8vo. Pp. 379.

Discourse on the Enlarged and Pendulous Abdomen; showing it to be a visceral affection, attended with important consequences in the human economy, with cursory observations on Diet, &c. for the use of the Dyspeptic. 2d Edition. Augmented by a Dissertation on Gout, suggesting new physiological views of its cause, with directions for its treatment and prevention. By Richard Frankum, Esq. Surgeon. London, 1842. 12mo. Pp. 121.

The Hunterian Oration delivered at the Royal College of Surgeons in London, February 14, 1842. By G. G. Babington, Surgeon to St George's Hospital. London, 1842. 8vo. Pp. 32.

Friederich Tiedemann, Professor in Heidelberg. Von der Duverneyschen, Bartholinschen oder Cowperschen Drüsen des Weibs und der schiefen Gestaltung und Lage der Gebärmutter. Mit Vier Tafeln Abbildildungen. Heidelberg und Leipzig, 1840. 4to. Pp. 42.

Statistical Reports on the Sickness, Mortality, and Invaliding among her Majesty's Troops serving in Ceylon, the Tenasserim Provinces; and the Burmese Empire. Prepared from the Records of the Army Medical Department and War Office Returns. Presented to both Houses of Parliament, by Command of her Majesty. London, 1841. Folio. Pp. 68. Pp. 20. Pp. 24.

The Transactions of the Provincial Medical and Surgical Association. Instituted 1832. Volume X. London and Worcester, 1842. 8vo. Pp. 354.

Pharmaceutical Journal and Transactions. Edited by Jacob Bell. No. 8. London, February 1, 1842. 8vo. Pp. 385 to 442.

Gazette Medicale de Paris, No. 51. Samedi, 18th Decembre 1841. No. 52, 25th Dec. No. 1. No. 11, Samedi, 12th Mars 1842.

L'Examinateur Medicale, No. 26. Dimanche, 19th Decembre 1841.

The Medico-Chirurgical Review and Journal of Practical Medicine, No. 71. January 1842. Being No. 29 of a Decennial Series. Edited by James Johnson, M.D. London, 1842.

The British and Foreign Medical Review, or Quarterly Journal of Practical Medicine and Surgery. Edited by John Forbes, M. D. &c. No. xxv. January 1842.

The London Medical Gazette for the Session 1841–1842. New Series. No. 13, 17th Dec. 1841. No. 25, 11th March 1842.

Comptes Rendus Hebdomadaires des Seances de l'Academie des Sciences, par MM. Les Secretaires Perpetuels. No. 22, 29th Nov. 1841. Paris, 4to.

Weekly Tables of Mortality for the Metropolis, No. 49, 11th December 1841—No. 52, 1st January 1842—No. 10, 12th March 1842.

THE

EDINBURGH

MEDICAL AND SURGICAL JOURNAL.

1. APRIL 1842.

PROPERTY OF THE N.Y. MED. SOC.

PART I.

ORIGINAL COMMUNICATIONS.

ART. I.—*Pathological Contributions.* By Dr Boyd, Resident Physician, St Marylebone Infirmary, Lecturer on Practice of Medicine.

The method employed in investigating the morbid conditions in the following cases of abdominal disease is the same as already described in the "Pathological Contributions" which have appeared in the Edinburgh Medical and Surgical Journal, Volume lv., No. 147, April 1841.

The contents of the three great cavities, head, chest, and abdomen, have been examined in almost every instance, or mention is made where such has not been the case. Organs are not, however, individually mentioned, unless when in a diseased or abnormal state, and when in either of these states their weight also is added.

The weight of a diseased organ when compared with the standard weight (as given in the volume of the Journal specified) will in many cases enable us to form a fairer estimate of the actual amount of disease than is possible by any other means.

No standard has yet been made out of the average weight of the organs of children. In the present instance, as on the former occasion, the weights of their bodies, as well as that of some of the organs, of the newly born or very young children, have been given. From these cases it must be observed, that a wide difference often exists between the weights of the bodies of very young or newly born children, without a corresponding difference of weight in their organs, or such organs whose weight have been given.

During the years 1840 and ten months of 1841, 73 cases have been examined, where the contents of the abdomen, including the digestive and genito-urinary organs, have been principally diseased, or have presented some marked peculiarity. Of these cases 32 were males, and 41 females, 17 were newly born or very young children.

Distribution of diseases were as follows; peritonitis seven cases; ascites, six; hernia, three; scrofula, five; digestive organs, thirty-two; including ten cases of cancer, two of poison from oxalic acid, and one of malformation; genito-urinary organs, twenty. Two of these deaths consequent on parturition.

Case 1.—*Diseases of Abdomen.—Peritonitis.*—Female of colour, aged 39. Swelling of the abdomen was observed five years ago, but the urgent symptoms only came on about three weeks before death.

Appearances.—Chest.—There were some adhesions of the right lung to the parietes, and slight thickening and redness of the bronchial lining membrane. The heart enlarged, weighing 10½ ounces.

Abdomen.—The contents were firmly matted together, and could not be separated without difficulty. Uterus was dilated as much as it would have been a week after delivery, (she had never born children), and the interior was rough and irregular, with bands of lymph and dark-coloured matter, passing in various directions, and in two parts spiculæ of bone were imbedded; near the fundus was a tumour about the size of an orange, filled with a coagulable fluid, and towards the cervix were two smaller ones of a similar character. The ovaries and Fallopian tubes were firmly adherent to the back of the uterus, and in the left ovary was found a cyst containing about two ounces of a straw-coloured fluid.

Case 2.—*Peritonitis.*—Female, aged 42. Had frequently suffered from pain in the region of the liver.

Appearances—Chest.—The right lung was congested. There was effusion of lymph on the under surface of the left lobe.

Abdomen.—General inflammation, especially of the cæcum, the intestines matted together, with a deposit of purulent matter over the whole surface. The liver was considerably enlarged, weighing 56½ ounces, and the edge and under surface of the right lobe were covered with effused lymph. The structure of the left kidney was entirely removed; nothing more than a ligamentous tissue remaining. Right kidney much enlarged, weighing 6¼ ounces.

Case 3.—*Puerperal Peritonitis.*—This case, aged 19, occurred at a lying-in-hospital in the neighbourhood, the body was brought here to be buried, and was examined at the request of the friends.

Appearances.—*Head and Chest.*—Organs in a healthy condition.

Abdomen.—Peritonæum was very vascular, and contained in its cavity about half-a pint of straw-coloured fluid. Uterus weighed twenty ounces, and was highly injected; death occurred fourteen days after delivery.

Case 4.—*Peritonitis from ulceration and perforation of cæcum.*—Female, aged 63. Diarrhœa six weeks; but acute pain did not come on until a short time before death.

Appearances.—*Head.*—A considerable quantity of fluid beneath arachnoid covering the hemispheres of the brain; not more fluid than usual in the lateral ventricles.

Chest.—The organs contained, in a healthy condition.

Abdomen.—Small intestines of a pink colour, matted together with recently effused and plastic lymph; old and firm adhesions of large intestines, more especially around the cæcum, on the anterior surface of which was a gangrenous slough; a small quantity of fluid effused into the cavity of abdomen, but no feculent matter. The interior of cæcum presented a honeycomb appearance, interspersed with dark sloughs, the natural mucous lining membrane having entirely disappeared. A large cicatrix on the interior of the stomach; spleen enlarged, weighing 6¾ ounces.

Case 5.—*Peritonitis from violence.*—Male, aged 73, carpenter. He stated when admitted, that he had pushed a long piece of stick up the anus three days before; an examination was made, but nothing could be felt. He gradually sunk and died in 48 hours after admission.

Appearances.—*Head.*—Arachnoid membrane thickened.

Chest.—Some condensation of the right lung, which weighed 35½ ounces; congestion of the lower lobe of the left, which weighed 21½ ounces, and the cicatrix of a former cavity in the apex.

Abdomen.—The omentum adherent and discoloured, owing to an escape of the contents of the bowel into the peritoneal sac, through an opening caused by the stick, which was found to have passed through lower part of the colon. The stick measured ten inches in length, and nearly five projected into the cavity of the abdomen. The other organs were in a healthy condition.

Case 6.—*Latent Peritonitis from accident.*—A carpenter, aged 74, fell from a height. He continued at work for a fortnight, when he was seized during the night with a most acute pain in the abdomen, with violent vomiting; his bowels obstinately costive. These were relieved by injections, but the pain and vomiting continued unabated, and he died in ten hours after the occurrence of the violent symptoms.

Appearances.—Chest.—Lungs rather congested; some old adhesions existed between the pericardium and heart, especially on the upper surface.

Abdomen.—Some redness of small intestines. They were adherent from lymph recently effused. There was no disease of other organs.

Case 7.—*Chronic Peritonitis.*—Male, aged 43, labourer, suffering from great debility on his admission, which he said was owing to destitution for a considerable time before.

Appearances.—Abdomen when opened presented a cellular appearance, from a number of bands of false membrane passing across to the parietes in different directions; the interstices filled with a straw-coloured fluid. The anterior surface of right lobe of liver attached to diaphragm through the medium of similar bands. Liver enlarged, weighing 57½ ounces: kidneys 10½ ounces.

Case 8.—*Ascites, accompanied by Anasarca.*—Male, aged 11. The dropsical symptoms came on during convalescence from scarlatina, four or five weeks after the disappearance of the eruption. On his admission, the abdomen was considerably distended by fluid; thighs and legs also from same cause; the latter relieved by acupuncture. Diuretics were given without effect. To relieve dyspnœa, which occurred during the progress of the disease, *paracentesis abdominis* was performed upon two occasions, and several pints of fluid were drawn off. Fits resembling apoplexy, but unaccompanied by paralysis, came on a few days before death.

The body examined on the following day, disclosed the following

Appearances.— Head.—Convolutions of brain flattened, not vascular, or containing an excess of fluid.

Chest.—Lungs condensed, lower lobes congested; aorta and branches of its arch had their lining membrane of a pink colour.

Abdomen.—Right kidney double the size of left, both of a fawn colour, and abnormal in structure.

Case 9.—*Ascites and diseased Liver, complicated with pulmonary disease.*—Male, aged 45, brass-worker; subject to cough for about four months. The dropsical symptoms came on about six weeks, and pneumonic sputa a month before he died. The abdomen was tense from the quantity of effused fluid, but there was no œdema of the extremities on his admission. A week after epistaxis came on, and œdema of the legs; the gums slightly affected by mercury. Elaterium was administered, and produced copious watery evacuations, relieving the drowsiness of which he had latterly complained. The urine was tested two or three times soon after admission, but no albumen detected, but a fortnight after, a deposit was thrown down, both by nitric acid and bichloride of mercury. The urine was scanty, and he felt pain over the pubic region; delirium and *subsultus tendinum* came on; he fell into a soporose state; the eyes turned down; pupils dilated; and in this state he died.

Appearances.—Chest.—Old pleuritic adhesions of both lungs; several semitransparent miliary granules beneath the *pleura pulmonalis*, giving to it a feeling of roughness; structure of the apices dark and condensed; the posterior portion of the lower lobes in a state of chronic inflammation; bronchial lining membrane red, and thickened, covered with a muco-purulent secretion; lungs weighed 70½ ounces. The abdomen contained two gallons of dark fluid; some old peritonitic adhesions between the great curvature of the stomach, omentum, and transverse arch of the colon; mucous membrane of stomach spotted with matter of a black colour, spots about the size of a split-pea. The liver was rough on both its upper and lower surface, and presented what has been termed the "hob-nail" appearance, and of a yellowish brown colour, (*Cirrhosis.*) The right renal capsule was firmly adherent to it. It weighed 45½ ounces. The gall-bladder contained a very small quantity of dark bile; spleen enlarged 11½ ounces; kidneys flattened, and of a pale colour.

Case 10. — *Ascites, Chronic Peritonitis, and Pleuritis.* — Male, aged 41; had been tapped for abdominal dropsy before his admission, and afterwards, upon four occasions, during the time he was a patient, for more than four months before his death. The fluid became paler and thicker after each time he was tapped. The quantity drawn off upon each occasion amounted to more than a common stable bucket-full. The navel projected considerably; its parietes were very thin; a puncture was made by a lancet, and the fluid drawn off. The patient was unusually sanguine about his recovery. It was found out after his death that he had been in the habit of relieving the distension of the abdomen occasionally in secret, from the accumulation of fluid, by making a puncture through the navel. Pain in abdomen complained of for the first time, three days before death.

Appearances.—Chest.—Old adhesions of the pulmonic to costal pleura, most extensive on the right side, also at the base of lung on that side, with some recent effusion of lymph and congestion of lower lobe of lung; bronchial lining membrane thickened and red.

Abdomen contained a large quantity of turbid fluid of a yellow colour; peritoneum covering the abdominal muscles on front and sides of abdomen thickened, and red on the two lower thirds of that cavity. Great omentum, stomach, and transverse arch of colon firmly connected by a thick layer of false membrane; spleen enlarged; the greater portion covered with lymph; weight 19 ounces; liver firm, pale, having a rough surface; the peritoneal coat thickened, as well as the diapraghm; weight of liver only 30½ ounces.

CASE 11.—*Ascites.*—Male, aged 57. The left arm had been amputated in early life, and scrofulous abscesses now covered the left breast, extending on to the left axilla.

Appearances.—*Head.*—Brain softened and pale, with about one ounce of fluid in the lateral ventricles.

Chest.—A few tubercles, becoming soft in the apex of the left lung; both lungs firmly adherent throughout their whole extent to the parietes, with congestion in the lower lobes.

Abdomen contained a large quantity of fluid, the intestines and other organs were very pale; liver large, weighing 65 ounces; spleen slightly enlarged, five ounces, and had on it a white fibrous deposit about the size of a shilling; kidneys also enlarged, weighing 11¾ ounces.

CASE 12.—*Ascites with Hydrothorax, &c.*—Female, aged 48. Anasarca of lower extremities. When admitted, this gradually disappeared; the left arm then became much swollen by effusion; but this after a while subsided.

Appearances.—*Chest.*—Some fluid, but not a large quantity, in the pleura; lower lobes of lungs congested; weight 48 ounces; heart a deposit like a warty excrescence on the aortic semilunar valves, size of a pea; a similar but larger deposit also on the mitral valve. These appeared to be of the same nature as the clots of fibrine which are so often found in the heart of persons where death occurs very slowly.

Abdomen contained a large quantity of fluid; omentum much contracted and thickened by a white deposition, firm like scirrhus; liver enlarged, having a similar deposition on its surface to that in omentum; spleen and capsule, which firmly adhered to ribs, presented a like deposition; uterus about four times the natural size, having around its neck and fundus several of these white deposits, as well as *os tincæ* and upper part of vagina; several cysts attached to the ovaries, largest one the size of an orange, having some of the white deposit on their surface.

CASE 13.—*Ascites.*—Male twin, still-born. Weight of body 88 ounces.

Appearances.—*Head.*—Considerable congestion of vessels of brain, and also a more than usual quantity of clear fluid in that organ.

Chest.—Some ecchymosed spots of blood on surface of lungs below their peritoneal covering. Weight of right lung 6 drachms; that of left 4 drachms.

Abdomen contained a considerable quantity of fluid; ecchymosed spots on intestines, similar to those on the lungs.

CASE 14.—*Hernia.*—Female, aged 60. She had been subject to a descent of a hernial tumour in the femoral region for two years, which she had always returned herself, until two days before her admission, when it became strangulated, and vomiting soon came on. After her admission, the vomiting ceased for several hours, though she had taken a draught of castor oil. The usual means were resorted to for reducing the hernia, but unsuccessfully; fæcal vomiting came on again during the night, and the operation was performed in the morning. The intestine was returned, and the bowels moved four times by an enema. The next day the abdomen became tender, for which leeches were applied, but she gradually sunk 48 hours after the operation, with symptoms of peritonitis.

Appearances.—The strictured portion of intestine presented an intense degree of redness, with a false membrane externally, and a hardened constricted ring internally, felt by introducing the finger into the gut. The inflammation of the peritoneum general, but not to the same extent, as it was at the part which had formed the hernia.

Case 15.—*Hernia.*—Female, age 72; strangulated femoral hernia of right side. Four days before her admission she could not be prevailed on to have the operation performed until the following day. A considerable quantity of fluid escaped on opening the sac, and again, when the bowel was returned, the gut was dark-coloured; some of the omentum was adherent to the sac, and could not be returned. She died the third day after the operation.

Appearances.—*Chest.*—Emphysematous state of both lungs, one large bulla, size of a hen's egg. *Heart.* Hypertrophy of left ventricle.

Abdomen.—Redness and great congestion of the intestines. A portion of the small intestines, about four inches in length, had a coating of recent lymph. *Omentum.* Old adhesions to ascending colon, as well as to the hernial sac.

Uterus.—Very much congested; two small polypi from the fundus, a cavity in one of them.

Case 16.—*Hernia.*—Male, aged 40. No history of his case. Body brought in to be buried.

Appearances.—*Chest.*—Pneumonia of lower lobes of both lungs; right most affected. *Heart.* Dilatation and hypertrophy, with ossific deposition at the region of the aorta.

Abdomen.—Congestion of the liver; strangulated scrotal hernia; the intestine in the sac in a highly congested and almost gangrenous state.

Case 17.—*Scrofula.*—Male, aged 18 months. Great emaciation of the extremities, with tumid abdomen. Weight of body 128 ounces.

Appearances.—*Chest.*—A circumscribed hardened deposit in the lower lobe of the left lung.

Abdomen—Mesenteric glands much enlarged; liver eight ounces; lungs five and a quarter ounces.

Case 18.—*Scrofula.*—Male, aged 11. He had a very voracious appetite till two days before death.

Appearances.—Head.—Brain. Between three and four ounces of serum in the lateral ventricles.

Chest.—Bronchial glands enlarged, containing scrofulous deposition, no tubercles in the lungs.

Abdomen.—Peritonæum generally studded with scrofulous tubercles; stomach, under surface of liver, and spleen, and pancreas, were all firmly adherent together.

Case 19.—*Scrofula.*—Female, aged 10 months. Weight of body 160½ ounces.

Appearances.—Chest.—Shoulders high; sternum prominent; lungs emphysematous.

Abdomen.—Mesenteric glands greatly enlarged; liver, 9½ ounces; lungs, 4¾ ounces.

Case 20.—*Scrofula.*—Female, aged four months. Weight of body 160 ounces.

Appearances.—No disease observed in any of the organs.

Abdomen.—Mesenteric glands enlarged; lungs 2 ounces; liver 4⅝ ounces.

Case 21.—*Scrofula.*—Male, aged two years; had been under treatment four months for scrofulous ulcers, and tabes. Three days before death the child was visited by a relation, who gave him an orange, which he devoured greedily, rind and all. Soon after which the abdomen became tympanitic, the bowels constipated; restlessness and great anxiety for two days afterwards, when death occurred.

Appearances.—Abdomen. Stomach contained several pieces of orange filled with juice, the septa being unbroken, and quite undigested. Some similar pieces were found in duodenum and upper portion of small intestines; mesenteric glands enlarged.

Digestive Organs.—Case 22.—*Hæmatemesis from ulcer in stomach.* Female, aged 25. Hæmatemesis existed for twelve days before death—sometimes two days intervening between the attacks. The body was at length quite bleached from loss of blood, and the patient sunk in one fortnight after her feeling it necessary to apply for medical relief.

Appearances.—Head and chest. Organs in a bloodless state, the heart contained a small quantity of fluid blood.

Abdomen.—An ulcer about the size of a half-penny in the lesser curvature of the stomach, nearer the cardiac than the pyloric orifice. Edges of ulcer raised and rather hard, but not remarkably so. *Vena cava* contained no blood. The abdominal organs also in a bloodless state.

Case 23.—*Hæmatemesis.*—Cause not discovered. A farrier, aged 33. Ill about twelve days, out-door patient; attacks had been very frequent; a large quantity of blood brought up on each occasion.

Appearances.—Chest.—The right lung infiltrated with blood, which appeared to have passed down the bronchial tube. The stomach was healthy, with the exception of a red spot in the centre. Ileum contained dots of blood of an arterial character.

Case 24.—*Hæmatemesis.*—Male, aged 42. Had been ill three weeks, but vomited blood only on the day before his death. He then brought up a large quantity, the attacks rapidly succeeding each other until he expired.

Appearances.—Head.—Brain very pale and soft.

Chest.—Congestion of the base of the right lung, the lower lobe of the left adhered firmly to the parietes. Heart much enlarged, weighing 17 ounces.

Abdomen.—Spleen much enlarged, weighing 20 ounces. Kidneys very pale; stomach filled with red mucus.

Case 25.—*Chronic Gastritis.*—Female, aged 45. Pain across the epigastrium for a month previous to admission, tongue red, especially at the edge. Bowels open, no vomiting. The catamenia had been absent about eighteen months.

Appearances.—Abdomen.—Stomach, its coats were much thickened, its mucous membrane soft and easily detached; patches of injected vessels scattered throughout its whole extent, and presenting in some parts a well-defined circular appearance.

Case 26.—*Diarrhœa.*—Female, aged ten weeks. Great emaciation, suffering from sickness, together with the diarrhœa; the mother an unhealthy scrofulous person. Weight of child 61 ounces.

Appearances—Chest.—The lungs posteriorly hepatized, but not to a great extent. Weight 1½ ounce.

Abdomen.—The stomach was filled with a sour-smelling milky fluid; the intestines were pale and distended.

Case 27.—*Diarrhœa.*—Female, aged two months, much emaciated. Weight of child 96 ounces.

Appearances.—Head.—Congestion of vessels on surface of brain.

Chest from a quarter to half-an inch of the margin of the lower lobes of both lungs had the appearance of being hepatized, forming a striking contrast to the portion of healthy lung immediately above. Weight of lungs 2¾ ounces; right lung weighed two drachms more than the left.

Abdomen.—Mesenteric glands greatly enlarged.

Case 28.—*Diarrhœa.*—Female, aged 74; with the symptoms of decay from old age.

Appearances.—Chest.—Thickening, with congestion of bronchial lining membrane.

Abdomen.—A few red patches on mucous membrane of colon; no ulceration of any portion of intestinal canal; organs in an atrophied state; liver weighing 29 ounces; kidneys 6¼ ounces; and spleen 1½ ounces.

CASE 29.—*Diarrhœa—Tabes mesenterica.*—Male child, aged eight months; general wasting of body; its mother, a patient in the infirmary, labouring under phthisis. The child is stated to have been healthy and strong at, and for some time after, birth. The only disease apparent by dissection was a great enlargement of mesenteric glands; weight of child 192 ounces; weight of lungs five ounces.

Case 30.—*Colic.*—Male, aged 16 months; was for some time subject to slight cough, but death occurred rather suddenly, being preceded for a few hours by violent spasmodic contraction of the abdominal muscles. The examination was made out of the house, at the request of the medical practitioner who had attended the case.

Appearances.—Chest.—A few tubercles in right lung; heart distended vith blood; thymus body very large, covering a great portion of the pericardium, and half-an ounce in weight.

Abdomen.—Several of the mesenteric glands were much enlarged, containing softened tubercular matter; external and anterior surface of stomach of a pink colour.

CASE 31.—*Ileus.*—Male, aged 29; light porter, was attacked with symptoms like colic, attended with pain in the side, which was relieved by cupping. He had been unable to get his bowels open for four days previous to his admission. On a former occasion he suffered from an attack of obstinate constipation lasting some days, and for which he was attended at home. When admitted, the abdomen was greatly distended. The lower portion was afterwards relieved by enemata administered through a long tube; but the upper part remained unaltered. Various forms of medicine were given without the slightest benefit. The stomach was in a very irritable condition, rejecting both food and medicine. An endeavour was made to support the system by injections of beef-tea, &c. Fæcal vomiting commenced on the evening of the third day after his admission, and continued at various intervals till death, which occurred on the fifth day. A large quantity of fæculent fluid matter was discharged within a short period from the stomach, nearly sufficient to fill five chamber vessels. He died from suffocation during his endeavours to relieve his stomach of this offensive matter; the powers of life having previously been reduced to the lowest ebb.

Appearances.—Redness of the mucous membrane lining the stomach and upper part of the ileum; the transverse arch and descending portion to the sigmoid flexure, distended with fluid fæces. Below this the intestine was contracted so as scarcely to admit the little finger; and this contraction extended throughout the remainder of the intestine downwards about twenty inches, through the rectum to the anus. A rent was made whilst removing the intestines from the body in the mucous membrane of the sigmoid flexure of the colon, from the weight of the fæculent matter above the stricture. The abdomen only was permitted to be examined.

Case. 32.—*Ulceration of Colon.*—Female, aged 43; complained on admission of acute rheumatism, principally affecting the left wrist, which, with the hand, was red and swollen. Pain in bowels, accompanied with sickness and vomiting, came on three days after admission, and a severe attack of diarrhœa two days before death, which event took place on the eighth day after admission.

Appearances.—Liver greatly enlarged, weighing 71½ ounces. A small quantity of lymph on external surface of cæcum. The interior of cæcum, and fifteen to twenty inches of colon, presented a considerable degree of inflammation, and very irregular dark surface, from extensive ulceration. The structure firm, from a quarter to half-an inch in thickness. The darkness extended in some places into this thickened structure, giving it when divided a mottled appearance.

Case 33.—*Ulceration of the Colon and Rectum.*—Female, aged 47. Had diarrhœa, resisting all attempts to cure for some weeks previous to death, and latterly symptoms of pneumonia.

Appearances.—*Head.*—Brain pale and rather soft, with rather larger quantity of fluid in the ventricles than is usual.

Chest.—Right lung healthy; but about half of the lower lobe of the left lung was indurated, œdmatous; hypertrophy of the left ventricle of the heart, which weighed 13½ ounces.

Abdomen.—The mucous membrane lining the cæcum was in a congested state; but in the colon were several ulcers about the size and shape of an almond.

Case 34.—*Ulceration of the Colon.*—Female, aged 65; symptoms of dysentery existed for five weeks before death.

Appearances.—*Abdomen.*—The intestines were very much distended with gas, and on opening the colon numerous oval, and some irregular ulcers were seen, from the size of a split-pea to that of a small bean.

Case 35.—*Ulceration of Ileum, Cæcum, and Colon.*—Male, aged 28; he was attended as an out-patient for dysentery. The body was brought in to be buried, and was examined.

Appearances.—*Abdomen.*—The liver was enormously enlarged and fatty, weighing 149 ounces. A series of irregular ulcers extended through the ileum, cæcum, and colon; most numerous in the latter.

CASE 36.—*Ulceration of Colon, complicated with Pulmonary Disease.*—Male, aged 70. Passed a considerable quantity of blood with his motions for one month before admission. He had been operated upon for *fistula in ano* in the infirmary about eight years ago.

Appearances.—Head.—The lateral ventricles of the brain contained about one ounce of clear-coloured fluid.

Chest.—A few tubercles in the apices of lungs; the lower lobes were also diseased, but not to any great extent; their structure was softer than usual, which appeared to be the result of a chronic or low degree of inflammation.

Abdomen.—Several small white specks on surface of liver; a large quantity of fat in the omentum; body in other parts being greatly wasted; small intestines almost transparent from thinness of their coats; their inner surface presented several small ulcers, some in process of healing, vascular specks, and cicatrices of ulcers already healed; cæcum and colon very rough and vascular in the interior, nearly the whole of the mucous lining membrane destroyed.

CASE 37.—*Ulceration of great Intestines, complicated with pulmonary disease.* Male, aged 62.

Appearances.—Brain.—Several vesicles in the choroid plexus of different sizes. On the outer covering of one of the largest was a white deposit, which felt rough and hard under the point of the scalpel, like to a spiculum of bone.

Chest.—A small cavity in the apex of each lung; pleura covering the apices thickened with bands of membrane passing to the ribs; other parts of lung free from adhesions. A bronchial tube, very much dilated, was traced into the cavity at the apex of one lung, and a smaller tube leading into the cavity in the other. Two small masses of tuberculous deposit in the left lung; no tubercles in the right.

Abdomen.—Fatty liver, weight 52 ounces; very extensive ulceration; destruction of the mucous membrane throughout nearly the whole course of the large intestines. A digital cavity or process from the ileum.

CASE 38.—*Ulceration of Colon and Rectum, complicated with Pulmonary Disease.*—Male, aged 60. Admitted for extensive ulceration of legs nearly two months under treatment; had been subject to rheumatism; bowels became relaxed about five weeks before death; blood passed sometimes with the motions; these were also attended with tenesmus. The symptoms were not relieved by any of the usual remedies. Neither sulphate of copper or nitrate of silver, gave any relief. The starch, with opium injection, allayed pain for a short time.

Appearances.—Brain.—Structure firm; the lateral and third ventricles dilated, they contained about four ounces of clear fluid

Chest.—A small tuberculous cavity in apex of right lung, which weighed 24 ounces; left lung, 19 ounces.

Abdomen.—Mucous membrane of rectum and two lower thirds of colon wanting in some places, presenting in others, a red granulated surface. Other portions of intestine in a healthy state; abdominal aorta, as low down as its bifurcation, contained several plates of ossific deposits.

CASE 39.—*Thickening of Stomach from a granular deposition, complicated with ascites.*—Female, aged 53, laundress.

Appearances.—*Chest.*—Congestion of the lower lobe of right lung, which weighed 17¼ ounces; the left weighed 10 ounces; heart small, weighing 5¾ ounces.

Abdomen.—The peritoneum studded with granulations, varying in size from a pin's-head to that of a pea. They were most prominent in the small intestines and the mesentery, broader and flatter on the parietes. The great omentum curled up towards the stomach, being about two inches in width, and half-an-inch in thickness, it cut very much like brawn.

Stomach.—Only a small portion of the great curvature presented a healthy appearance, the other part being considerably thickened, especially its anterior surface and around the pylorus.

CASE 40.—*Cancer of Stomach and Liver.*—Female, aged 80. Died in the workhouse; diarrhœa of some standing, latterly accompanied with discharge of blood.

Appearances.—Ulcer with callous and raised edge, size of a half crown-piece, at pyloric extremity of stomach, close to the duodenum; several cancerous tubercles in the liver, firm externally, and soft towards centre; largest, about the circumference of a shilling; mucous membrane of colon covered by a sanguineous exudation. Liver weighed 39 ounces; lungs, 25 ounces; and heart, 7¾ ounces.

CASE 41.—*Cancer of Stomach and Peritoneum, complicated with Ascites.*—Female, aged 50, laundress. Death occurred five weeks after admission; hæmatemesis three days previous to death; great emaciation; abdominal parietes much attenuated.

Appearances.—*Chest.*—A portion of the inferior lobe of right lung infiltrated with dark blood; heart small, weighing 6½ ounces.

Abdomen contained a large quantity of straw-coloured fluid.

Stomach.—Pylorus thickened and hard; valve destroyed; small intestines of a purple colour, dotted over with numerous small white specks; omentum and mesentery much thickened, as well as the covering of liver and spleen; glands enlarged around the head of pancreas, and very firm; with difficulty distinguished from the organ itself, which was pale and very firm in texture. Liver weighed 40 ounces.

CASE 42.—*Cancer of Stomach, Costal Pleura, Lungs, and Diaphragm, complicated with Pleuritis.*—Female, aged 61. Laboured under an attack of hæmatemesis a few weeks before her admission, which soon ceased. Death occurred three weeks after admission.

Appearances.—Chest.—About one pint of fluid, mixed with some flakes of lymph, in right pleura; nearly half that quantity also in left pleura. Right lung compressed; old adhesions posteriorly; a few tubercles of scirrhous character in both lungs, principally confined to their lower lobes; tubercles or granules on upper surface of diaphragm, on the lower portion of costal pleura of right side, and also a few on pleura covering the lungs. Heart small, weighing seven ounces; some granules adhering to mitral valves; *foramen ovale* open sufficient to admit the point of the little-finger.

Abdomen.—Stomach.—An ulcer at the pyloric opening, size of a penny-piece; scirrhus of the pylorus, to which the gall-bladder and head of pancreas were firmly connected in one solid mass; liver wasted, weighing only 27¼ ounces; a scirrhous tumour in left lobe; spleen contained in its substance a white mass of the size of a hazel-nut; left kidney unusually firm in structure; uterus, two small semitransparent bodies attached to *os tincæ.* The cellular tissue behind the aorta firm like scirrhus.

CASE 43.—*Cancer of Stomach, cardiac extremity.*—Female, aged 63, servant. Had suffered from sickness constantly after taking food for two months previous to her death, with but few hours intermission.

Appearances.—Chest.—Congestion of the lower lobe of the right lung, which weighed 21 ounces; left lung, 7½ ounces; heart atrophied, weighing 6¼ ounces; œsophagus much thickened, and in a contracted state.

Abdomen.—Hardening and great thickening of cardiac orifice of stomach, so as to prevent the little-finger being passed in; the coats were also thickened for about two inches lower down, towards the greater curvature. The remainder of stomach in a very contracted state, and like to intestine. Liver small, weighing only 35 ounces; a few tubercles on its surface; a tuberculous deposit on the diaphragm and on the peritoneum, especially that lining the pelvis. Great omentum contracted, and having a scirrhous character. A large tubercle in the fundus of the uterus, and in that situation where the fibrous tumours are frequently found in the substance of that organ. Left ovary contained a hydatid cyst, about the size of an orange, in the interior of which were several smaller ones.

CASE 44.—*Cancer of Stomach.*—Male, aged 73. Gradual wasting, and death four weeks after admission.

Appearances.—Chest.—Pneumonia of left lung, which weighed 22 ounces, weight of right lung 15¼ ounces.

Stomach.—Much thickened in about three-fourths of its extent,—with destruction of the mucous membrane, weight, 11¾ ounces. Liver, three or four cancerous tubercles; the largest about the size of a pigeon's egg. They appeared to be separated from the parenchyma by a membrane, and to have proceeded from the peritoneal surface; the liver only weighed 32½ ounces.

Case 45.—*Cancer of Rectum.*—Female, aged 23. The disease was one of long standing, she having been a patient in different hospitals, where she had been operated on for fistula two or three times. When admitted to the institution she refused to submit to any remedial treatment, became gradually weak, and died in the chronic ward in the workhouse, where she had been removed some time previous. She was of a pale scrofulous diathesis, with sandy hair, and very short, being only four feet seven inches in height. She had never menstruated, and her general appearance was that of a child; the breasts and genital organs not being at all developed.

Appearances.—The lungs collapsed and congested in the lower lobes; each weighed 6¼ ounces.

Abdomen.—The liver considerably enlarged and fatty, and weighing 53 ounces. Old peritoneal adhesions in the lower part of the abdomen. Uterus very small, and firmly adherent by the whole of its anterior surface to the bladder. Extensive ulceration of the rectum, which had destroyed the sphincter muscle, so that the power of retaining fæces had been for some time lost. The gut above this was hardened and thickened, and adherent to the uterus.

Case 46.—*Poison—Oxalic Acid.*—Male, aged 40. A letter-carrier. He was found dead in the Regent's Park by the police, and brought to the Infirmary, about one hour after having taken poison in a public house in the neighbourhood, as was afterwards proved at the coroner's inquest. The stomach-pump was introduced with a view of ascertaining what poison had been taken. On analyzing the contents, a large quantity of oxalic acid was found.

Appearances.—Inspection three days after death. *Head.* Congestion of vessels on brain; a small quantity of blood effused below arachnoid on posterior and upper portion of right hemisphere; about two ounces of straw-coloured fluid in lateral ventricles.

Chest.—Congestion of inferior portion of lower lobes of lungs, more especially the right; redness of bronchial lining membrane. Heart distended with fluid, florid blood; greatest distension on the left side. *Foramen ovale* sufficiently open to admit a quill to pass through. *Aorta.* Lining membrane of a red colour; redness became more vivid on exposure to atmosphere; only two arteries arose from the arch, innominata, and left subclavian.

Abdomen.—External surface of stomach and surrounding parts, of a dark-greenish colour; veins of stomach distended with carbonaceous matter; texture of the organ soft; stomach contained 1½ ounces of gray pulpous matter, mixed with small masses of decarbonized blood. Patches of ecchymosis with erosion of mucous membrane in several points, and softening; after stomach was washed, large patches of viscid mucus adhered to different points of the lining membrane. The first six inches of the lining membrane of duodenum presented appearances analogous to those of the stomach. Those appearances grew less distinct towards the ileum. The mucous membrane, through the whole of jejunum, presented a pinky appearance, and extended through the ileum to within about twelve inches of ileo-colic valve. The large intestines presented the natural appearances. Tongue and œsophagus partially eroded, as if acted on by a strong caustic.

Case 47.—*Poison*; *Oxalic Acid.*—*Pulmonary disease.*—Male, aged 48, mat-maker, death four days after admission. On the evening before his admission he took two pennyworth (supposed to be about an ounce) of oxalic acid to get rid, as he said, of his suffering of some months' duration; vomiting came on soon after the poison being taken. The following morning he mentioned what he had done, and was visited for the first time by Dr Gamble from the infirmary, about sixteen hours after he swallowed the poison. Some magnesia and lime-water, previously dissolved, were immediately administered to him. He did not at first seem to suffer in the slightest degree from the effects of the poison, till after the lapse of two days, when he complained of epigastric pain, which was increased by pressure. Death occurred two days afterwards.

An inquisition was held on the body. Some difficulty appeared to exist with the jury in determining whether death was caused by the poison or the pulmonary disease, under which he had laboured for some time. They came at length to the decision that the poison was the immediate cause of death, and gave their verdict accordingly; he being of unsound mind at the time of his taking the poison. The body was afterwards examined sixty hours after death.

Appearances.—*Head.*—Large, cerebellum weighing 6 ounces,—an ounce or more above the average weight.

Chest.—Extensive pleuritic adhesion of both lungs, and the pleura much thickened. Tubercular deposits in lungs, and large cavities in their apices; congestion of their lower lobes; weight of lungs 81½ ounces. Heart enlarged, weighing 11½ ounces.

Abdomen—*Stomach.*—A red patch about the size of the palm of the hand at its great curvature, with slight thickening of the membrane. Kidneys very large, weighing 17 ounces. Liver weighed 55 ounces.

Case 48.—*Malformation*; *imperforate Anus.*—Female child, aged 4 days; died at the residence of her parents, and was brought here for interment.

Weight of child, 81 ounces; of liver, 3¾ ounces, and lungs, 1¼ ounce.

Appearances.—Abdomen considerably distended; rectum terminated in a dilated bag of an oval form, about four inches long, and nearly two inches above the anus, to which it was connected by a thin process of condensed cellular tissue. From appearances in this case, any attempt by art, to remedy this malformation, could only have been made with effect through the side.

CASE 49.—*Hepatitis.*—Female, aged 55. Had a severe pain in right side and shoulder about five weeks before admission, attended with sickness and vomiting; fæces light-coloured; sickness and vomiting continued, together with a troublesome short cough up to the time of her death.

Appearances.—*Head.*—Brain natural, except some staining of *dura mater.*

Chest.—Lower lobe of right lung in a state of chronic pneumonia, reddish brown coloured fluid flowing from divided surface on pressure; the cellular structure at edge infiltrated with serum; lymph also effused on pleura covering the affected lobe; other portions of lung not much changed; the coats of pulmonary vessels presented a yellow tinge; weight of right lung 35½ ounces; weight of left being only 18½ ounces.

Abdomen.—No tendency to dropsy in any part of body; liver enormously enlarged, and thickly studded with purulent deposits, from the size of a pea to that of a hazel-nut; the purulent matter contained in cavities mixed with bile of a yellow tinge. Each cavity in which this purulent matter was contained was lined by a membrane, from which flocculent shreddy tissue spread into the abscess.

Weight of liver, 90 ounces.

CASE 50.—*Icterus, obstruction in cystic duct.*—Female, aged 61. Ill four weeks previous to admission; skin and conjunctiva of a deep yellow colour; urine high-coloured, and small in quantity; edge of the liver felt about three inches below the umbilicus; fæces light-coloured; absence of bile. Death occurred eleven weeks after admission.

Appearances.—Substance of brain of the natural colour, but the *dura mater*, as well as the other tissues, bones, cartilages, &c. of a deep yellow.

Chest.—Right lung pressed upwards by the liver; heart enlarged, weighing 12¾ ounces.

Abdomen.—Liver greatly enlarged, connected by old and firm adhesions to intestines and spleen; several tubercles on its surface of a convex and oval shape, and about three-quarters of an inch at longest diameter. The capsule of Glisson, firm, dense, and thickened like cartilage.

Duodenum.—Adherent to the neck of the gall-bladder, the bile passing into it when the latter was pressed; a calculus the size of a filbert impacted in the cystic duct, which was greatly distended; numerous smaller calculi in gall-bladder; the stomach and small intestines, as far as ileum, full of coagulated blood.

Case 51.—*Cancer of Liver, with Ascites.*—Female, aged 24. She complained before death of great tenderness on slight pressure being made over the abdomen, accompanied by most obstinate vomiting, resisting every attempt at relief.

Appearances.—Head.—The convolutions of the brain were pale, firm, and flattened, but without any fluid in the ventricles.

Abdomen.—About 14 quarts of straw-coloured serum were contained in its cavity; the extremities were œdematous, but no trace of inflammation, either in the form of injection or effused lymph, or peritoneal adhesions, could be discovered. The liver was the organ diseased, being greatly enlarged, weighing 63 ounces, and had a hard marble-like appearance.

Case 52.—*Cancer of the Liver.*—Male, aged 49. He had laboured under symptoms of ascites three months before his death, and ten weeks with anasarca; the latter relieved by the acupuncture needles.

Appearances.—*Abdomen.*—Contained about one quart of a brownish-coloured fluid.

Stomach.—Its concave margin was smaller than usual; around the pyloric extremity there was a carcinomatous deposit, which extended on to, and surrounded the pancreas, being firmly attached to it.

Liver.—The largest that had been seen by any of the persons present; during life, it formed a projection in the epigastric and right hypochondriac regions, and weighed 192 ounces; natural structure had disappeared, and its place was occupied by numerous carcinomatous tumours, from the size of a pigeon's egg to that of a goose's egg, the interspaces filled with loose cellular tissue; gall-bladder was empty and collapsed; carcinomatous deposits were also found in Glisson's capsule.

Case 53.—*Cancer of Liver, and Gangrene of Stomach.*—Female, aged 51. No history of case.

Appearances.—Abdomen.—Peritoneum studded in various places with tubercles of various sizes, and degrees of consistency, the largest on the portion covering intestines.

Stomach.—Lesser curvature and capsule of Glisson occupied by a scirrhous mass; its anterior surface pulpy and dark-coloured, in a gangrenous state.

Liver.—Contained scirrhous tubercles; the under surface of left lobe in a similar dark pulpy state to that of anterior surface of stomach, on which it rested. Weight of liver 56 ounces.

GENITO-URINARY ORGANS.

CASE 54. — *Calculi in Kidney.*—Male, aged 81, labourer. Diarrhœa when admitted; death in four days afterwards.

Appearances.—Chest.—Pleuritic adhesions on right side, and congestion of lower lobe of right lung, which weighed 36½ ounces; left 25½ ounces.

Abdomen.—Liver, deep indentations on its convex surface; left kidney had its pelvis filled with calculi; right kidney unusually large; no calculi in bladder; no stricture of urethra.

CASE 55.—*Granular Kidneys, Anasarca, with Gastric and Pulmonary disease.*—Female, aged 60, laundress. Death took place three weeks after her being admitted.

Appearances—Head.—An examination not permitted.

Chest.—A large phthisical cavity in apex of left lung; pleura thickened and adherent to parietes over that portion of lung; adhesions of pleura also at upper portion of lower lobe of right lung, in which was a small tuberculous cavity; weight of lungs 29 ounces.

Abdomen.—Mucous membrane of stomach intensely red, and covered by a viscid fluid; *small intestines*, slight ulceration of mucous membrane in parts, and a few white granular deposits on their external surface.

Liver.—Pale-coloured, weight 46 ounces.

Kidneys.—Wasted, rough, and granular on surface, a small serous cyst in right one; weight of kidneys 5¼ ounces.

Uterus.—Some blood effused beneath its lining membrane; anasarca, general, of extremities.

CASE 56.—*Diseased Kidneys with Convulsions and Pulmonary Disease.*—Female, aged 45. When admitted, in a state of stupor, convulsions occasionally; death occurred one fortnight after admission.

Appearances—Head.—Brain appeared to be tightly packed within the skull, no other appreciable change.

Chest.—Prominent; old pleuritic adhesions existed between lungs and parietes; lower lobe of left lung partly in a state of congestion, and other portion hepatized; diaphragm beneath it; presented also a vascular appearance.

Abdomen.—Some slight peritoneal adhesions of long standing.

Kidneys.—Very pale, when divided, presenting a uniform smooth surface, no difference appearing to exist between the tubular and cortical structure. The urine in bladder found to contain a large portion of albumen.

CASE 57.—*Diseased Kidney.*—Female, aged 10 months. Brought in to be buried, said to have been out and in apparent good health two days before death.

Appearances.—Chest.—Great congestion of lower lobe of left lung, which weighed 1¼ ounce; right lung weighed one ounce.

Abdomen—Stomach.—Mucous membrane soft and pulpy, torn, contents escaping into abdomen, merely in separating it from its attachments.

Right Kidney.—Double the size of left one, having a brown mottled appearance, easily detached from its capsule. Weight of right kidney two ounces; left one ounce; weight of body 14 pounds.

Case 58.—*Diseased Kidney.*—Male, aged 33. Attributed his illness to an injury of the loins.

Appearances—Abdomen.—Kidneys greatly wasted, weight 5½ ounces, no other organic disease observed.

Case 59.—*Diseased Kidneys, Pulmonary Disease, &c.*—Male, aged 31. Labourer. Admitted with general dropsical symptoms, which almost entirely subsided before his death. Caries of some of the bones of right tarsus. Death occurred five months after admission.

Appearances—Chest.—Pleuritic adhesions on both sides; a small tuberculous cavity in apex of right lung.

Abdomen.—Kidneys pale, very much enlarged, presenting some of the appearances as described by Dr Bright; weight 15½ ounces; urine contained albumen.

Case 60.—*Calculi and Abscess in Kidneys,—Inflamed Bladder.*—Female, aged 50. Servant; married; had six children; suffered considerably of late years from pain in loins when pregnant; pain most acute at left side. These symptoms had greatly increased during the seven weeks preceding her admission. A tumour was then felt extending from spine of ileum to left hypochondriac region. This swelling was painful, hot, and throbbing, and went on increasing for a week, after which it began to subside; a quantity of purulent matter at the same time being passed with the urine, having a heavy disagreeable odour. The swelling almost entirely subsided in six days, the purulent discharge still continuing in urine, but not in so great quantity. Great irritation of bladder existed, and patient required frequently to make water, the stream being sometimes stopped suddenly. The bladder was examined; no calculus was detected. Gradual sinking, and death one month after admission.

Appearances.—Liver large, weighing 54½ ounces.

Kidneys.—Spleen and pancreas were found firmly adherent to upper end of kidney, and a quantity of dark purulent matter escaped from the kidney through which it burrowed; calices red; lining membrane thickened as well as that of ureter, in which was also found a similar kind of dark purulent matter. Right kidney had impacted in it four calculi, one large one, taking the form of portions of calices. A calculus weighing about 15 grains, having a smooth surface, was found in bladder, the mucous membrane of which was inflamed and ulcerated in two places.

CASE 61.—*Diseased Kidney and Bladder complicated with Pulmonary Disease.*—Male, aged 79. Complained of pyrosis a week before he was admitted; death occurred two weeks after his admission.

Appearances—*Chest.*—Pleuritic adhesions of both lungs to the parietes, with subacute inflammation in the posterior part of lower lobe of right lung which weighed 22 ounces, the left only 12 ounces.

Abdomen.—Capsule of spleen semicartilaginous and adherent to the diaphragm; kidneys small, weighing 6¾ ounces; the left contained in its pelvis muco-purulent matter; the same kind of matter was also found in the bladder, the coats of which were thickened; prostate enlarged and very firm.

CASE 62.—*Gangrene of Bladder and enlarged Prostate Gland.*—Omnibus porter, aged 71. Formerly a patient in Infirmary, suffering from retention of urine from prostatic disease, from which he was relieved at the time and discharged. For the last three weeks the catheter was introduced two or three times a-day. Two days before death every attempt to pass a catheter failed; the bladder became greatly distended; symptoms of sinking rapidly came on. The bladder was punctured above pubes, after which he revived for a few hours, but the symptoms of sinking soon came on again, and he died.

Appearances.—*Abdomen.*—Kidneys weighed 10¼ ounces. No disease detected in any of the organs of body except the bladder, the mucous membrane of which was greatly thickened; fundus in a state of gangrene, a slough partly detached of the size of the palm of the hand; *prostate*, lobes enlarged, each lateral lobe size of a hen's egg.

CASE 63.—*Stricture of Urethra, Inflammation of Bladder and Ureters.*—Aged 54; death occurred two weeks after admission.

Appearances—*Chest.*—Heart enlarged, weight 18½ ounces.

Abdomen.—Kidneys much enlarged, weighing 15 ounces; bladder greatly thickened, outer coats very firm, having a cartilaginous feel, the lining membrane softened; phosphatic calculous deposits mixed with mucus on its surface; a rough oval calculus, soft in structure, encysted near the trigone; *ureters*, lining membrane red and thickened; urethra also presented decided marks of inflammation; stricture in spongy portion of urethra about 2½ inches in length; urethra dilated behind the stricture.

CASE 64.—*Stricture of Urethra and Gangrene of Scrotum.*—Aged 81. When admitted he was in a very exhausted condition; stated that the scrotum had been affected five days; had formerly experienced difficulty in voiding urine; now passed it freely; did not rally, but sunk and died in forty hours.

Appearances—Chest.—Both lungs adherent to parietes; the right, which was œdematous, more firmly than the left; emphysema of the lower lobes of both; the right weighed 18½ ounces, the left 13 ounces; atheromatous deposit in the aorta, and destruction of the two internal coats to about the size of a fourpenny-piece.

Abdomen.—Liver near the average weight, 47 ounces, but soft; five calculi in gall-bladder; spleen soft; a cartilaginous deposit with ossific points covering the whole capsule.

Bladder.—Hypertrophy of the muscular coat; inflammation and thickening of mucous membrane; it contained two ounces of bloody urine mixed with flaky matter; *prostate* enlarged, about half-an inch long of the bulbous portion, and half-an inch of the mucous membrane of the membranous portion of urethra destroyed; scrotum distended with fœtid sanies, mixed with purulent matter.

Case 65.—*Rupture of the Uterus during Parturition.*—Aged 43; sixth child; was attended by a midwife at her lodgings, where the body was examined twenty-one hours after death. She kept a fruit-stall in the street. Labour came on while attending to her occupation at half-past seven o'clock P. M. The pains were very strong at twelve o'clock, and continued till half-past three so much so, that the midwife expected at each pain the child would be born, when they suddenly ceased. She now felt pain over the epigastrium, which was much increased on pressure. A medical man saw her between eight and nine o'clock in the morning, more than five hours after the cessation of the labour pains. He found the uterus fully dilated, the waters having escaped several hours before, with the head of the child firmly impacted in the brim of the pelvis, the woman in a cold clammy sweat, pulse scarcely perceptible, and other symptoms of rapid sinking. Indeed she was so low, that, although he had brought the forceps with him for the purpose of delivery, he did not consider himself justified in using them. Every means were employed to recover her without success, and she died soon afterwards.

Appearances.—Abdomen very prominent, with an ecchymosed spot about the size of the palm of the hand around the umbilicus. On making an incision through the *linea alba*, the arm of the child was seen lying on the left side, and on carefully removing the intestines, the body was found lying on its left side, out of the uterus in the left "*iliac fossa*;" the feet extending to the stomach, opposite the eleventh rib; the placenta was also in the cavity of the abdomen; the uterus lying a little below the umbilicus, and ruptured transversely on the anterior surface, near the neck, to an extent that admitted both hands closed.

Case 66.—*Lingering Labour, and subsequent exhaustion.*—

Aged 31. The body sent to the Infirmary to be examined eighty hours after death, by order of the coroner; the patient was attended by a midwife; the labour lasted fifty-six hours, and she died three hours and a-half after its termination.

Appearances.—No external signs of decomposition. Head. Emphysema of scalp, with discoloration, especially at the posterior part; a small quantity of blood escaped when the top of the skull was taken off. Brain pale and firm; convolutions flattened; about ten drachms of sero-sanguinolent fluid in lateral ventricles; some blood effused on the tentorium at the posterior extremities of hemispheres; vessels of cerebellum and pons congested.—*Thorax.* Emphysema of anterior edge of right lung; œdema of its posterior portion; the whole of left lung adhering to parietes; congestion of its lower lobe; trachea contained a small quantity of red mucus; about two ounces of fluid in the right pleura; heart flabby, weighed 11 ounces; all its cavities contained semifluid blood, more completely coagulated in the left than in the right side.

Abdomen.—Stomach bloodless, distended with air, and containing a small quantity of fluid; spleen and liver flabby, under surface of latter adhering to colon; blood in the hepatic vessels darker and thicker than in portal. Kidneys, effusion of blood under the mucous membrane of pelvis. Uterus filled the pelvis, and extended beyond it to within three inches of the umbilicus, could readily be drawn up as high as pancreas; a coagulum weighing 1½ ounce attached to the right side of fundus; uterus pale, weighed 40 ounces; bladder empty.

Case 67.—*Cancer of Uterus, Atrophy of left Kidney.*—Aged 66. Great emaciation.

Appearances.—*Chest.*—Weight of lungs, 14¼ ounces; heart, 7½ ounces.

Abdomen.—Liver, 30 ounces; left kidney, nearly the whole of its structure absorbed, weight, 1½ ounce; right kidney, 4¼ ounces in weight; uterus almost entirely destroyed by ulceration, and neck of bladder partially; ovaries free from disease.

Case 68.—*Cancer of uterus and Mesenteric Glands.*—Nurse, aged 36, married, had born children; subject to occasional menorrhagia, accompanied with pains in the loins; for three or four months these symptoms increased in frequency; she became a patient, and remained under treatment for six months, when death occurred; body much emaciated.

Appearances.—*Chest.*—Some congestion in lower lobe of right lung; its weight was 11½ ounces; that of left, 9¾ ounces; heart small, weight 5½ ounces.

Abdomen.—Organs generally small and pale, except the liver, which weighed 40 ounces; uterus large; *os tincæ* ragged, ulcerated; the ulceration extending internally towards fundus of uterus; a carcinomatous mass connected the uterus with the left ovary; mesenteric glands enlarged and scirrhous.

Case 69.—*Cancer of Vagina and Uterus, Peritonitis.*—Aged 27; fourteen months ill. Death took place on the third day after admission. Uterine hemorrhage more or less at times, for a period of nine months. No swelling externally; pain on pressure over uterine region. Ulceration was found to commence a short distance from external orifice of vagina.

Appearances.—Chest.—Old pleuritic adhesions of left lung; weight of lungs, 21 ounces; heart, 8 ounces.

Abdomen.—Liver, 40 ounces; ureters and pelvis of kidneys dilated with urine, from pressure and tumefaction of parts near neck of bladder. Extensive ulceration and destruction of two upper thirds of vagina and neck of uterus; fundus or body not diseased; weight of uterus, two ounces; great omentum adherent to left ovary, around which there was thickening, with inflammation of peritoneum, and effusion of purulent matter for about a hand's-breadth.

Case 70.—*Cancer of Vagina and Neck of Uterus.*—Nurse, aged 34, married, had born children; under treatment two months before death; ill for six weeks previously, but still following her occupation to the time of her coming under treatment. A profuse fœtid discharge from vagina, not tinged with blood; rapid emaciation of body.

Appearances.—Chest.—Emphysema of both lungs; old pleuritic adhesions of left; weight of lungs, 19 ounces.

Abdomen.—Ragged ulceration of upper half of vagina, extending to neck of uterus, not extending to the body of the organ, which was double the size of a healthy unimpregnated one.

Case 71.—*Cancer of Uterus, Vagina, and Liver, Pneumonia.*—Charwoman, aged 51; menorrhagia occasionally occurring for a period of eighteen months; death four weeks after admission. Inspection twenty-seven hours after death.

Appearances.—Chest.—Right lung, lower lobe, infiltrated with sanguineo-purulent fluid; its structure broken down by slight pressure; weight, 18 ounces; left lung weighed 7 ounces; heart, 11½ ounces.

Abdomen.—Liver enlarged; four cancerous tumours imbedded in its substance; largest tubercle size of a walnut; weight of liver, 54½ ounces; kidneys enlarged, weighing 11 ounces; uterus ragged; ulceration of *os tincæ*, and upper part of vagina; ovaries had attached to them hydatid cysts; Fallopian tubes dilated, containing a dark fluid of a deep black colour; weight of uterus with ovaries attached, 7 ounces.

Case 72 *Dropsy of Fallopian Tubes.*—Name and history unknown; appeared to be about 40 years of age; brought in for interment. A coroner's inquisition was held on the body, and death was said to have occurred from the effects of laudanum. Inspection five days after death.

Appearances.—Head.—Congestion of vessels of brain.

Abdomen.—Stomach contained about four ounces of dark-coloured fluid, having the odour of phosphuretted hydrogen. Fallopian tubes distended to the size of small intestines, containing a clear fluid; fimbriated extremities adherent to ovaries; no other organic disease detected.

CASE 73.—*Malformation of Genital Organs, Malposition of Kidneys, Cerebral and Pulmonary Disease.*—Widow, aged 72; latterly became childish.

Appearances.—Head.—Opacity of arachnoid, lateral ventricles contained from three to four ounces of clear fluid.

Chest.—Emphysema of both lungs, and congestion of right lower lobe, to a small portion of which also some lymph was adherent. Bronchial mucous membrane thickened and covered with muco-purulent secretion; weight of right lung, 17¼ ounces; that of left, 10¾ ounces.

Abdomen.—Kidneys of usual size and appearance; right one in *iliac fossa* below cæcum; left kidney in pelvis below psoas muscle, resting on sacrum, rather to the left of median line. Its artery appeared to be the principal terminating branch of left internal iliac. Renal capsules in their usual position, resting on crura of diaphragm, on either side the spine. Uterus and Fallopian tubes were not present. Right ovary presented the natural structure. To its free extremity, a small oval sac was attached by a thin neck; a round ligament connected the ovary to cellular tissue, behind the neck of bladder. Situation of left ovary occupied by a globular fibrous tumour, connected also by a round ligament as the right ovary. External parts of generation presented the usual appearance. A *cul de sac*, about half an inch deep, occupied the place, and was all that existed of vagina; mammæ well developed for so old a person.*

The arrangement of diseases in the following table is similar, but more condensed than in the table of diseases for 1839; abstracts from which were printed in the auditor's half-yearly reports, and in the Edinburgh Medical and Surgical Journal, No. 147.

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* Last case, (73,) has already been published in the twenty-fourth volume of the Medico-Chirurgical Transactions, London, but without reference to the diseased organs.

TABLE of Diseases admitted into the St Mary-le-bone Infirmary during the year 1840, showing the number in each Quarter, distinguishing the Sex; also stating the Period of Life and Nature of Result. By R. BOYD, M. D., Resident Physician.

	Disease.	Quarters of year.								Total.		Period of life.				Nat. of result.			Cases.
		1st Qr.		2d Qr.		3d Qr.		4th Qr.				Under 7 years.	From 7 to 20.	20 to 45.	45 and upwar.	Cured.	Incur-able.	Dead.	
		Mal.	Fem	Mal.	Fem	Mal.	Fem	Mal.	Fem	Mal.	Fem								
Of the digestive organs.	Inflammation, - - -	3	6	2	14	3	12	5	10	13	42	1	9	29	16	43	2	10	55
	Ulceration, - - -	2	1	1	2	4	2	0	1	7	6	1	3	5	4	4	3	6	13
	Diarrhœa, - - - - -	4	4	6	9	9	7	4	4	23	24	12	7	15	13	43	0	4	47
	Dyspepsia, - - -	3	2	0	2	5	1	0	4	8	9	2	5	5	5	15	2	0	17
	Colic, - - - - -	0	0	5	0	5	1	1	3	11	4	3	0	6	6	13	2	0	15
	Surgical hernia, fistula, and piles,	2	2	1	2	1	3	2	1	6	8	1	3	5	5	8	4	2	14
	Diseases of liver, - -	3	2	1	0	1	2	0	0	5	4	0	0	6	3	6	2	1	9
Of the respiratory organs.	Inflammation of lungs and pleura,	6	5	16	10	7	15	15	14	44	44	20	9	25	34	35	0	33	88
	Bronchitis and asthma, -	15	41	8	22	9	13	17	48	49	124	14	3	67	89	68	77	28	173
	Pulmonary consumption,	18	8	18	20	15	12	14	16	65	56	8	14	48	51	0	24	97	121
	Hooping cough, - -	1	0	0	0	5	1	0	0	6	1	7	0	0	0	7	0	0	7
	Influenza, - - - -	0	1	1	2	0	1	1	2	2	6	2	1	1	4	8	0	0	8
Vascular system, heart, vessels, and blood.	Inflammation of pericardium,	1	0	1	2	1	0	0	0	3	2	1	0	0	4	3	0	2	5
	Enlarged heart, - -	7	2	3	3	4	2	2	5	16	12	0	3	5	20	0	20	8	28
	Aneurism, - - -	0	1	0	1	0	0	0	0	0	2	0	0	0	2	0	0	2	2
	Diseased state of blood, -	3	3	2	2	2	5	0	9	7	19	4	7	11	4	24	1	1	26
	Hemorrhage, - - -	1	0	4	0	2	0	2	0	9	0	0	3	5	1	9	0	0	9
	Dropsy, - - -	0	6	2	5	2	3	3	3	7	17	0	1	10	13	3	8	13	24
	Scrofula, - - - -	8	5	4	4	3	5	9	8	24	22	16	25	4	1	5	32	9	46
	Cancer and lupus, - -	4	7	0	1	0	4	0	0	4	12	0	1	5	10	0	8	8	16
Genito urin. organs.	Disease of kidney and genital organs, bladder and urethra,	3	1	5	6	4	3	1	2	13	12	2	2	14	7	14	8	3	25
	Syphilis, - - -	4	15	4	8	3	9	4	11	15	43	1	28	26	3	57	1	0	58

Nervous system.	Neuralgia,	0	6	3	4	0	4	1	6	4	20	0	5	11	8	22	2	0	24
	Hysteria,	0	7	0	10	0	7	0	2	0	26	0	12	14	0	26	0	0	26
	Delirium tremens,	2	1	4	0	0	0	0	0	6	1	0	0	3	4	3	1	3	7
	Convulsions,	2	4	6	2	2	3	8	2	18	11	4	3	9	13	14	11	4	29
	Epilepsy,	2	1	2	3	1	0	3	2	8	6	1	3	9	1	0	14	0	14
	Insanity,*	9	12	8	28	7	13	6	11	30	64	0	4	53	37	55	0	6	94
	Inflam. of brain and membranes,	1	8	6	4	0	6	3	4	10	22	1	3	9	19	10	8	14	32
	Apoplexy,	1	3	3	4	3	2	4	6	11	15	0	0	5	21	1	6	19	26
	Paralysis,	6	2	5	1	2	2	4	2	17	7	1	2	6	15	1	16	7	24
	Disease of Eye,	5	5	8	16	4	5	12	7	29	33	20	31	9	2	51	11	0	62
Loco-motive organs.	Inflamed bursæ and periosteum,	1	3	4	3	2	6	2	4	9	16	0	7	13	5	21	3	1	25
	Diseased bones and cartilages,	3	1	0	3	0	2	1	0	4	6	4	4	1	1	5	4	1	10
	Dislocations, fractures, & contus.	2	1	6	9	10	4	10	7	28	21	3	10	14	22	45	2	2	49
	Rheumatism and gout,	19	7	17	19	16	17	16	20	68	63	0	11	57	63	100	31	0	131
Cellular tissue.	Abscess,	8	4	5	7	4	4	10	8	27	23	4	19	21	6	50	0	0	50
	Ulceration,	6	13	7	11	8	6	16	15	37	45	4	13	21	44	64	18	0	82
	Gangrene,	1	1	2	4	4	1	4	8	11	14	0	2	4	19	14	0	11	25
	Burns,	1	1	3	5	1	0	1	2	6	8	7	2	5	0	14	0	0	14
	Chilblains,	21	1	0	0	0	0	24	0	45	1	6	38	2	0	46	0	0	46
Eruptive fevers.	Skin diseases,	19	17	20	26	31	37	14	47	84	127	98	78	12	23	206	5	0	211
	Erysipelas,	3	4	8	7	2	7	1	2	14	20	3	2	16	13	32	0	2	34
	Measles,	24	15	3	3	3	4	1	3	31	25	47	6	3	0	50	0	6	56
	Scarlatina,	3	1	8	3	2	2	2	2	15	8	6	13	4	0	22	0	1	23
	Small-pox,†	0	0	4	2	1	0	3	6	8	8	9	4	3	0	0	0	0	16
	Fever,	6	15	18	24	9	15	19	29	52	83	9	47	58	21	122	0	13	135
	Old age,	0	2	0	2	0	1	0	1	0	6	0	0	0	6	0	5	1	6
	Destitution,	1	2	0	0	1	1	0	2	2	5	0	0	6	0	7	0	0	7
	Unknown causes,	0	1	0	0	0	0	0	0	0	1	0	0	0	11	0	0	1	1
	Aggregate,	234	250	234	315	198	250	245	339	911	1154	322	444	660	639	1366	331	319	2065

* 33 of those cases were sent to lunatic asylums.

† The whole of those cases were transferred to the Small-pox Hospital.

The number of cases classified in the table for last year is 2065. Of these 911 are males, 1154 females. The deaths 319, being upwards of 15 per cent; mortality among the males 17 per cent., among the females nearly 14 per cent. 700 cases more than the above number have been admitted to the Infirmary during the year. These were slight eruptive cases, occurring principally among children, such as are not usually received in other medical institutions, and also some cases not requiring treatment, as of mothers with sick infants.

The incurable column in the table applies to persons in the Workhouse, many of them aged, affected with asthma, enlargement of the heart, disease of the brain, &c. who, from changes in the weather or other accidental causes, suffer an aggravation of symptoms, and are admitted to the infirmary, from whence they are discharged to the chronic wards in W. H. when relieved.

The registries from which the table is formed could furnish additional information respecting the previous history of many cases, which may be hereafter supplied, when a larger number is accumulated.

Total number of cases and deaths under their different heads of disease, as given in table.

	Cases.	Deaths.		Cases.	Deaths.
Digestive Organs,	170	23	Locomotive Organs,	215	4
Respiratory Organs,	399	158	Cellular Tissue,	217	11
Vascular System,	156	43	Eruptive Fevers,	129	9
Genito-Urinary Organs, -	83	3	Fever, -	135	13
Nervous System,	276	53	Old age and unknown causes, -	14	2

By referring to the table, it will be seen that 97 deaths occurred from pulmonary consumption alone, which, if added to 9 from scrofula, will form one-third of the whole mortality. As the former disease is usually excluded from hospitals, when such a case chances to gain admission, it sometimes happens that even shortly before death it is sent to the Parochial Infirmary, where all cases of sickness have equally a right to be admitted.

Admissions and deaths in each quarter of the year 1840.

	Admissions.	Death.		Admissions.	Death.
1st quarter,	484	56	3d quarter,	448	68
2d quarter,	549	70	4th quarter,	584	95

An epidemic of measles occurred among the children in the nursery during the last quarter, several died of pneumonia at a longer or shorter period after the disappearance of the eruption.

Table of mortality according to age.

Under 1 year, -	17	From 30 to 40 -	46
From 1 to 2 years,	19	40 to 50 -	49
2 to 4 -	6	50 to 60 -	50
4 to 6 -	5	60 to 70 -	45
6 to 10 -	2	70 to 80 -	27
10 to 15 -	5	80 to 90 -	9
15 to 20 -	5	90 and upwards,	1
20 to 30 -	33		

The greatest mortality has been among the children under two years, and among persons above thirty years of age. In the former class, chiefly from pneumonia, as already mentioned; in the latter, generally from pulmonary tubercles.

Table of medical and surgical cases in each quarter of the year 1840; number of admissions; discharges and deaths; the average number of patients of each class and average stay of both.

	Admitted.		Discharged.		Dead.		Av. No in Infir.		Av. stay in Infir.	
	Phys.	Surg.	Phys.	Surg.	Phys.	Surg.	Phys.	Surg.	Ph.	Surg.
Quarter to 31st Mar,	378	377	365	355	76	10	122	98	27½	22¾
30th June,	271	344	248	383	66	4	91	113	31¼	24¾
30th Sept.	326	312	259	388	53	15	102	137	29½	27
31st Dec.	418	343	332	425	87	8	113	141	28½	30½

The whole admissions of the year are given in the above table, some hundreds of which have not been classified in the table of admissions, for reasons before given; medical and surgical cases admitted during the year have been nearly equal; mortality among the former have been above 22 per cent; among the latter not 3 per cent.

St Mary-le-bone Infirmary, Return from Lying-in-Ward for 1840.

Age.	Married.	Single.	Children previously born.				Miscarriage.	Child born.				Character of labour.			
			Alive.		Still-born.			Alive.		Dead.		Natural.		Preternatural.	Tedious.
			M.	F.	M.	F.		M.	F.	M.	F.		Durat. hours		
16	0	1	0	0	0	0	0	1	0	0	0	1	8	0	0
17	0	1	0	0	0	0	0	1	0	0	0	1	4	0	0
18	0	7	0	0	0	0	0	4	3	0	0	4	15	0	3
19	2	2	0	0	0	0	0	3	0	0	1	2	7½	1	1
20	1	15	0	0	1	0	0	4	8	1	2	11	8¾	1	4
21	3	9	0	1	0	0	1	9	2	0	1	9	14	0	3
22	4	12	2	2	0	0	0	8	4	3	1	11	9	2	3
23	0	3	0	0	0	0	1	2	1	0	0	2	13	0	1
24	5	12	5	2	0	0	1	6	11	0	0	15	10½	0	2
25	2	5	0	1	0	0	1	1	5	1	0	6	13½	1	0
26	3	8	3	2	0	2	0	3	6	1	1	8	9	1	2
27	5	2	3	2	0	0	1	3	3	1	0	7	7	0	0
28	5	3	1	5	2	1	3	4	2	1	1	5	16	1	2
29	5	1	5	2	0	0	1	4	1	2	0	6	10	0	0
30	5	3	7	11	1	0	1	4	3	1	0	6	13	1	1
31	3	2	3	4	0	1	1	4	1	0	0	5	7⅓	0	0
32	1	1	3	2	0	0	0	0	2	0	0	1	9½	0	1
33	0	3	6	5	1	0	1	3	0	0	0	3	11¼	0	0
34	2	0	2	1	0	0	0	1	1	0	0	2	6½	0	0
35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
36	0	1	0	1	0	0	0	0	1	0	0	1	7¾	0	0
37	2	0	7	11	0	1	3	0	1	0	1	1	21	1	0
38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	0	1	1	1	0	0	0	1	0	0	0	1	4	0	0
40	1	0	1	3	0	1	1	0	1	0	0	1	23	0	0
41	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
42	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
43	2	0	6	6	0	1	1	1	1	0	0	2	4½	0	0
	51	92	55	62	5	7	17	67	57	11	8	111		9	23

From the preceding return of lying-in-women it will be seen that 143 were delivered during the year 1840; of these, 48 were married, 92 single, and 3 were widows.

Forty of these women were married at the ages as follows, in table:—

No.	Age.	No.	Age.	No.	Age.	No.	Age.	No.	Age.
2	16	2	19	3	22	1	25	2	28
2	17	6	20	5	23	1	26	2	31
4	18	7	21	2	24	1	27		

Of the cases in the table, one woman had been twice married; another had born three children before marriage. Three women were attacked with inflammation of the womb; two suffered from inflamed breasts, and one from excoriated nipples; two were labouring under venereal disease at the time of delivery. In one of these, both fœtus and placenta were semiputrid.

One woman had twins on two occasions, all four being females. One woman was an idiot. Two deaths occurred during the year, one from hæmorrhage and hour-glass contraction of the uterus; the other from puerperal peritonitis nine days after confinement.

Of the children, there were born alive, 67 males and 57 females. One of the male children died on the fourth day. Eleven males and eight females were still-born; one of these born with the membranes entire.

St Mary-le-bone Infirmary.—Average number of in-door and out-door patients constantly under treatment, during each year, for last five years, distinguishing the number of each class.

	Out-Door Patients.				
Year.	Visited at home weekly.	Attending at Infirmary 3 times a-week.	Work-house patients 3 times a-week.	Total.	In-door patients treated in the Infirmary.
1836,	102	106	78	286	210
1837,	143	105	95	343	212
1838,	126	113	97	336	208
1839,	118	104	77	299	214
1840,	122	117	70	309	230

The out-patients have been divided into three classes. The first two include those visited at their own houses, and those who are able to attend for advice at the Infirmary. The third class consists of the sick inmates of the work-house, who are not so ill as to be admitted into the Infirmary, their diseases being, for the most part, mild, chronic, or incurable.

The class of out-patients who are attended at their own houses are frequently persons affected with some acute disease, which, for a time, keeps them from their usual employment. Unwilling to be separated from their families, they prefer this mode of medical relief, to being admitted to the Infirmary, under the hope (which is often realized) of shortly resuming their daily labour.

Two-thirds of the patients admitted to the Infirmary are from the work-house; these include a great number of children from the nursery, infant, and other schools, together with cases of disease from the chronic wards, suffering from accession of symptoms, or renewed attack.

The number of out-patients visited at their own houses during the year 1840 has been upwards of 3000. Of this number 304 were admitted into the Infirmary, leaving 2700 cases. 244 of these were cases after parturition among whom casualties seldom occur. By subtracting this number from the whole, we have left 2456 cases of the more serious and acute forms of disease.

The deaths during the year have been 175, something more than 7 per cent. among this class of patients.

From the table of admissions and deaths in the Infirmary for the same year, it appears that the mortality has been 15 per cent.

Among the 304 admissions to Infirmary above-mentioned, 87 died. By subtracting these from the total "admissions and deaths in the Infirmary," and adding them to the "out-patients visited at home," we ascertain that the mortality among the latter is about 9½ per cent. whereas that of the former is upwards of 13 per cent.

A death very rarely occurs among the "out-patients attending at Infirmary," as they are at once placed on the list of those "visited at home," should their disease assume a serious aspect. The mortality taken for these two classes combined is less than 4 per cent.

There are upwards of 350 cases in the chronic wards in the work-house, all more or less diseased, and many of them advanced in life. The mortality among this class of patients is about 70 in the course of the year.

The out-patients constantly under treatment for the last five years, average within a small fraction of 100 more, than those under treatment in the Infirmary during the same period.

A great increase has taken place in the number of out-patients, during the present year, (1841), as compared with any former year. On the 19th October, the medical orders to patients amounted to 1778 more than on the corresponding date last year.

Medical expenditure for each year during last five years :—

Year.	Nurses' Wages.			Wine & Spirits.			Surg. Instruments.			Drugs & Chemicals.			Salaries to Med. Of.			Totals.		
	£.	*s.*	*d.*	*£.*	*s.*	*d.*	*£.*	*s.*	*d.*	*£.*	*s.*	*d.*	*£.*	*s.*	*d.*	*£.*	*s.*	*d.*
1836,	257	7	1	148	13	3	58	17	1	561	12	1	448	6	7	1474	14	1
1837,	256	0	4	203	15	4	58	0	11	632	13	4	500	19	0	1651	8	11
1838,	267	16	10	287	19	9	43	7	4	572	0	3	510	11	6	1681	5	8
1839,	264	19	10	252	10	5	31	0	1	486	12	3	450	8	6	1485	11	1
1840,	275	1	10	153	11	3	41	16	10	621	4	5	456	13	0	1450	17	4

The expenditure for the year 1840 has been less than any of the preceding years. The number of patients has been greater for the years 1837 and 1838, in consequence of the prevalence of the influenza for some weeks during the winters of those years. The average cost of the work-house and out-patients amounts to one-half of that of the infirmary patients. This difference arises from the expense of nurses, wine, and spirits.

The average cost for work-house and out-patients was L.1, 17s. 11d. per annum; ditto, for Infirmary patients, L.3, 15s. 2¼d. per annum; expense for clothing, provisions, &c. for work-house and infirmary patients, 5s. per week, or L. 13 per annum.

ART. II.—*On the comparative advantages of Lithotomy and Lithotrity, and on the circumstances under which one method should be preferred to the other; being the Dissertation for which the Jacksonian Prize of* 1838 *was awarded to* EDWIN LEE, M. R. C. S., Corresponding Member of the Medical and Chirurgical Societies of Paris, Berlin, Naples, Florence, Bologna, Bordeaux, Lyons, Marseilles, and Toulouse, &c. (Continued from No. 150, p. 49.)

V.—OF THE CIRCUMSTANCES UNDER WHICH LITHOTOMY OR LITHOTRITY SHOULD BE PREFERRED.

AT an earlier period of the history of lithotrity, the opinion was very generally entertained, that from the difficulties which attended this operation, and the length of time required to be devoted to its study, its performance must be restricted to special operators, as was once the case with respect to lithotomy; and though this opinion has fortunately been disproved by lithotrity having become so far simplified as to render it practicable by the generality of surgeons, like any other operation, many still consider that it should be limited to a few particular cases, and that lithotomy must continue to be most suitable to by far the greater number; the latter operation being the rule applicable to all cases, and the former the exception. The preference to be accorded to one or other of these operations has been repeatedly made the subject of discussion in medical journals and societies; and in the debates of the Academie de Medecine, about five years ago, may be seen the opinions (which some have since seen reason to alter) of the most eminent French surgeons; though it is to be regretted thatthese discussions were not always conducted with that freedom from prejudice, and absence of party feeling which should especially characterize a scientific inquiry of such importance to the community at large. The subject was likewise ably treated by M. Blandin in his Prize Essay, notwithstanding the short time allowed for its composition; as also by MM. Leroy, Segalas, and others in their works, and more recently by M. Civiale, who in his Parallele enters fully into the consideration of the different points connected with both operations, with greater impartiality than might, *a priori*, have been expected from one who had for so long a period devoted his attention to lithotrity, of which he may be considered the inventor and principal promoter. In England also the question has been examined in a special work by Mr King, though at a time when lithotrity was much less general than at present. The works of Messrs Heurteloup and Belinaye were also published at a less advanced period of this operation, and more particularly refer to the method of percussion than to lithotrity as at present usually practised. Mr Key and several other surgeons have likewise published in the medical periodicals their opinions respecting the merits and demerits of lithotrity, as compared with lithotomy; though, from the difficulty of correctly ascertaining the results of the former operation, (in consequence of many of the unsuccessful cases not being made public), it will probably be long ere sufficient data will be obtained to enable the profession to form a just comparison between them.

It is not without attentive consideration of the arguments which have been brought forward on both sides, and of the cases which have fallen under my own observation, that I am induced to express my opinion as to the circumstances under which one of these operations should be preferred to the other. Considerable difficulty and uncertainty must, however, exist in defining the limits to which either operation should be restricted; though at the same time, there are certain cases, in which most unprejudiced persons, conversant with the subject, would at once declare lithotrity to be the most eligible method, and certain other cases in which lithotomy is more evidently indicated. Where both operations appear to offer equal probabilities of success, and the operator is doubtful which to recommend, the most prudent course would probably be to prefer lithotrity, as, in the event of unfavourable circumstances arising to prevent the completion of the operation, it might be given up, and recourse might be had to lithotomy as soon as the patient was in a fit state to support it. The two operations having in this respect some analogy with those for cataract, where, when couching is performed and does not succeed, vision is not destroyed, and the patient has still the chance of being relieved by a repetition of the operation, or by extraction at a subsequent period; whereas, if this latter method be at first resorted to, though it may be the most effectual means of removing the impediment at once, yet if it fail, the use of the eye will, in all probability, be irremediably lost; so with regard to the breaking up a stone in the bladder, if it should not succeed, the failure would not, except in a few cases, be fatal; and the patient might undergo with advantage another operation; whereas, if lithotomy be performed and fail, it almost necessarily induces the patient's death. Several instances have occurred in which patients who had been subjected to lithotrity were subsequently cut for the stone, and recovered; on the other hand, some of these patients died after the operation, which was not unlikely to have happened, even if lithotrity had not been attempted; though it cannot be denied that the failure of lithotrity would frequently place the patient in a less favourable condition for supporting lithotomy, not only with respect to the local condition of the parts, but also as far as his general state of health and moral are concerned.

Lithotrity may be considered as more especially suited to adults whose general health is good, and whose urinary organs are free from any other disease than the presence of stone; in whom the bladder is moderately capacious, not preternaturally irritable, and contains a single stone of small size, (as not exceeding the size of a filbert), and not excessively hard. A patient in whom these conditions are met with may be regarded as being under the most favourable circumstances for the operation, which in all probability would require but few sittings for its completion, without the occurrence of any of the more serious accidents which sometimes attend it. Nor are the instances in which all these propitious circumstances are united at all unfrequent; a large proportion of stone patients who apply to the surgeon for relief have, in fact, no disease but the stone, the presence of which is frequently not even manifested by the symptoms, but only becomes evident on sounding. It is true that a person under similar conditions is also in a very favourable state to undergo lithotomy, and would most probably recover; yet it must be borne in mind that, even in the most favourable cases, the mortality from lithotomy is great; that it is an operation of a most painful nature, and one of which patients entertain so great an apprehension, as not unfrequently to have a prejudicial effect on the result; that unexpected difficulties may arise during the operation, and accidents may supervene, compromising the patient's life; and that, even if every thing were to go on well, the patient must still be almost entirely confined to his bed, till the complete healing of the wound. Few surgeons, therefore, conversant with both operations, would hesitate in a similar case to recommend lithotrity; and even were the surgeon disposed to prefer lithotomy, many patients would decline adopting his recommendation, and would very likely apply to others whom they might think better able to cure them, without subjecting them to so formidable an operation.

Adults and elderly people, in other respects in the same conditions as those above specified, but in whom the stone is of larger size, as of a walnut, or from ten to fifteen lines in diameter, may also be considered in a favourable state to undergo lithotrity, though, of course, less so than when the stone is of smaller size. If, instead of one moderate sized stone, the bladder contain two or three small ones, the patient is not in a more unfavourable state, as he would be no worse than if he originally had a larger stone, which, after a sitting or two of lithotrity, had been broken into as many portions. Even when the bladder contains several stones, lithotrity may still be applied, if there be no other counter-indicating circumstances, and the stones be of small size, though, if there was reason to believe they were numerous, lithotomy would perhaps be the preferable operation, on account of the length of treatment required by lithotrity, and the existence of so many cases of irritation, superadded to that of the frequent introduction and manœuvring of instruments. Here, however, the degree of irritability of the parts and other circumstance must be taken into the account to guide the surgeon in his choice, as, though he may be aware that the bladder contains more than one stone, he cannot always be as certain that it contains several. In these cases, also, the tendency to the re-formation of calculi must not be lost sight of. This, indeed, would be one reason for preferring lithotrity, if other circumstances were not unfavourable to its employment, as a patient in whom this predisposition is strongly manifested would, even after lithotomy, very likely require another operation ere long, and this could not, like lithotrity, be repeated several times in the same person. A case of this kind occurred in France, in a M. Poterlet, who underwent five operations for the stone. Lithotrity was first performed on this patient by M. Heurteloup in 1826; it was repeated by M. Amussat in the course of the following year; the disease returned a third time, and the patient, considering that the preceding operations had left some fragments in the bladder, resolved to undergo lithotomy. The lateral operation was accordingly performed by M. Amussat. The bladder being perfectly emptied, a fresh stone, however, formed, and the patient has since undergone lithotrity for relapses.

The cases of Baron Zach, and of M. Baboin are illustrative of the successful application of lithotrity, when the bladder contained numerous calculi. According to M. Civiale, who was the operator on these occasions, the bladder of the former patient contained about forty calculi; and so little inconvenience was experienced from the operation, that after each sitting the surgeon and patient were accustomed to sit down together to breakfast. It is obvious, however, that if, in such a case, the calculi were of great density, or there existed much constitutional or local irritability, lithotrity would be attended with considerable risk, as a long period must necessarily be required for the treatment, and, should any unpleasant symptoms arise, they would be less likely to be combated with success, than in the more simple cases; and that, consequently, lithotomy, by which the whole of the foreign bodies might be at once removed, would be much preferable and afford the greatest chance of recovery. Where, however, circumstances exist to prevent the adoption of lithotomy, or to render its performance more than usually hazardous, the mere number of calculi (especially if moderately friable, and if the irritability of the parts be not very great), need not be as a positive counter-indication of lithotrity.

Lithotrity has been objected to in these as also in the simpler cases where the bladder only contains one stone, on the grounds that one or more of the calculi or fragments are liable to be left behind, after the operation is terminated. This, it is true, has occurred in several instances, and in some patients who were supposed to have been cured, but who afterwards died of the disease, an examination of the parts has exhibited the formation of fresh calculous depositions around the fragments of calculi which had been broken by lithotrity. Where also the sittings of lithotrity are obliged to be suspended for any length of time, the fragments very often become covered with a fresh coating of the phosphates. One of the first patients lithotritised at the Hotel-Dieu, a short time after he had been dismissed as cured, returned as ill as before, though when he left the hospital he had none of the symptoms of stone, nor could any remains of the foreign body be detected on sounding. This accident, though more likely to happen, is not peculiar to lithotrity, but may also occur after lithotomy, where the bladder contains several calculi, or where a stone is broken in attempting to extract it. When, however, after proper explorations of the bladder, no more calculi or fragments can be felt, it is fair to conclude that none exist. Even should any escape detection by being lodged in a fold of the bladder or otherwise, lithotrity should not bear the blame, as it can only attack what is tangible, and in many of the cases, where a calculus is again felt in the bladder some time after the performance of lithotomy or lithotrity, and the patient was considered to be cured, it is just as likely, or more so, to be the result of a subsequent descent from the kidneys, particularly when there have been several calculi, which indicates the great predisposition to their formation.

At all events, whether this be the case or not, the patient is seldom in a worse condition for supporting a repetition of lithotrity than at first, as in the instance of M. Poterlet, above quoted, and of several other individuals, on whom the operation has been repeatedly performed, on account of the re-formation of calculi.

When the stone is of considerable hardness, but of small size, lithotrity is applicable with great prospect of success, and, if there be no counter-indicating circumstances, should generally be preferred to lithotomy. The hardness of the stone (if it be small) need not, as formerly, prevent the performance of the operation, which will, in these cases, often be facilitated by the assistance of percussion, though the present improved instruments are able to break, by means of the screw, the hardest urinary calculi, without the danger of their giving way. When, however, there is reason to believe, that the stone is of larger size, as above twelve or fifteen lines in diameter, and that it is at the same time of great density, lithotrity would be attended with much more risk, and lithotomy would, in most cases, be the preferable method, especially if the symptoms of the disease be severe, and there exist much irritability of the bladder, on the passage of instruments. The hardness of a stone, though very unfavourable for lithotrity, is not so for lithotomy, but rather the reverse, as, when once the bladder is opened, it would be more easily extracted than a softer one, which might break by the pressure of the forceps, and would necessitate their more frequent introduction, with the risk of a portion being left in the bladder.

In proportion to the increased size of the stone beyond a certain point, as from twelve to fifteen lines in diameter, (due regard being always paid in estimating this circumstance to the relative capacity and irritability of the bladder) the case is more unfavourable for lithotrity, which is altogether unsuitable to very large calculi. In some cases, however, of large calculi (as of the size of a hen's egg) chiefly composed of the phosphates, and consequently more friable, lithotrity might still be preferred to lithotomy, which, in these cases, is not unfrequently counter-indicated; or its performance is attended with the greatest risk, on account of the diseased state of the urinary or other organs; consequently lithotrity, though performed under very disadvantageous circumstances, would afford the best chance of relieving the patient of his disease, and should be had recourse to, if the condition of the patient admitted of its application, with a likelihood of success.

The smaller, therefore, and the more friable the stone—other circumstances being the same—the more favourable is the condition of the patient for lithotrity. Some calculi are so soft as to break on the slightest touch, or fall to pieces spontaneously, forming a sort of mortar in the bladder. For these the lithotrite need not be used, as they would be better removed by the scoop catheter and injections of the bladder

Thus far I have considered the preference to be given to lithotomy or lithotrity, chiefly as regards the foreign body to be acted upon; but the condition of the parts most implicated in these operations, viz. the urethra and bladder, is a consideration of equal, if not of superior importance. Formerly, when straight instruments of a considerable diameter were used, it was frequently requisite to dilate the urethra for some time previously, in order to admit of their introduction, which circumstance, together with the canal being kept longer on the stretch during the instrumental manœuvres, was at times productive of serious consequences; and though the risk of these has been materially diminished by the improved construction of the instrument, yet a narrow urethra is a very unfavourable circumstance in a person about to undergo lithotrity, both on account of its rendering the operation more difficult, and also from its preventing the free escape of fragments, which must necessarily be broken into smaller portions, than in a person with a wider urethra, and consequently more sittings would be required for this purpose. The same may be said of partial narrowing of the urethra by stricture, which, though in many instances capable of being, in great measure, removed beforehand, and consequently need not counter-indicate lithotrity, when other circumstances are favourable to its employment, is yet a very unpleasant complication, and predisposes to the arrest of fragments in the passage the more readily, on account of the part between the stricture and the bladder being generally more dilated in persons who have long laboured under this disease. When co-existing with stricture, other states unfavourable for lithotrity are met with, as a largish or hard stone; a contracted or diseased state of the bladder; great irritability on the passage of instruments, or enlargement of the prostate; lithotomy would, in most cases, be preferable, and if successful would at once relieve the patient of his stone; and at the same time of the stricture, which may very possibly have occasioned the formation of the foreign body, by preventing the escape of gravel, which, in a healthy state of the urethra, might have passed away without difficulty.

In those persons whose urethra is more closely bound up to the *symphysis pubis*, the arch being higher than usual, the curve at the membranous portion is much increased, and is also more abrupt than in others. In such a case, lithotrity may induce some of the consequences to which I have before alluded, from the forcible straightening of the parts by an inflexible metallic instrument being repeatedly introduced and maintained in the passage for a longer or shorter period. It has been stated by some, that this objection cannot apply to the curved instrument, at present in use; but it must be remembered, that the curved part is exceedingly short, and is entirely within the bladder during the operation; while that part of the instrument occupying the neck of the bladder and the rest of the urethra is perfectly straight. Although, therefore, this obstacle may not be so great as to prevent the adoption of lithotrity, yet the operation would be attended with more pain than in ordinary cases; and if the stone were hard or of large size, and consequently likely to require many sittings for its removal, or if the introduction of the instrument were attended with much difficulty, and gave rise to symptoms of an alarming nature, it would probably be most prudent not to repeat the attempt, but to have recourse to lithotomy; if the state of the patient were such as to render this operation practicable with the probability of advantage. If, however, it were deemed advisable to proceed with lithotrity, the sittings should be short, and only repeated after the irritation from each had subsided.

Enlargement of the prostate, especially of its middle lobe, is also a common cause of increased curvature of the urethra, and may exist to such an extent as to render lithotrity impracticable with safety. When the enlargement is on one side, or exists only in a moderate degree, it need not counter-indicate the operation, though its performance would be rendered more difficult, particularly as regards the seizure of fragments, to the escape of which the enlarged prostate presents a great impediment, and more especially if there should, at the same time exist, as is not unfrequently the case, a state of atony of the bladder. On the other hand, enlargement of the prostate is also an unfavourable circumstance as regards lithotomy, not only on account of the difficulty of the operation being greater from the increased depth of substance between the skin and bladder, and of an incision being made through a part which is the seat of morbid alteration, but also because this state is not unfrequently complicated with disease of other organs, and occurs in old people in whom lithotomy is fatal in so large a proportion of cases; hence it is a greater object to avoid lithotomy in elderly persons, than in healthy adults, in whom there is less likelihood of its failure, particularly as, from the diminished irritability of the parts commonly attendant on advanced age, lithotrity is in general better borne than in younger subjects.

A contracted and thickened bladder is also a very unfavourable complication, as far as any operation is concerned. Lithotomy would be attended with great risk from the division of textures in a state of disease, and from their probable injury in extracting the stone. Lithotrity also, though perhaps in a similar case the preferable operation of the two, would have to be performed at a great disadvantage, on account of the bladder being able to contain only a small quantity of fluid, and of the instrument necessarily coming into contact with its parietes; but when the stone is large in comparison with the diminished capacity of the bladder, this operation would be less admissible, and lithotomy would probably offer the greatest chance of success. If the other indications should lead the surgeon to adopt lithotrity, and the first sittings were well borne, the probabilities would be greatly in favour of its success; but if the symptoms should become more severe, with increased irritability of the parts, and fever, it would be most prudent not to persevere with the operation, but to have recourse to lithotomy, as soon as the patient was in a fit state to support it. Some persons in whom this course has been pursued have done well, without appearing to have been placed in a worse state, by the previous trials of lithotrity.

When the symptoms of stone are very severe, the irritability of the bladder being high, and its contractions frequent, they would in many cases be increased by the attempts at lithotrity, which would be in some inadmissible, unless the irritability could be allayed by opiate injections, or other appropriate means. If, notwithstanding the existence of an irritable state of the parts, lithotrity be considered preferable to lithotomy, on account of the small size of the stone, and the likelihood of removing it in two or three sittings, each sitting should be much shorter than under other circumstances, and should not be repeated till the disturbance caused by the preceding one had subsided; tepid baths and other sedative remedies being employed after each sitting. It not unfrequently happens, however, that the irritability of the bladder, even when considerable at first, becomes materially lessened, after two or three sittings of lithotrity, as the bladder becomes more accustomed to the presence of the instrument; but here the surgeon must proceed with great caution, and, as it were, feel his way; for if, instead of subsiding, the symptoms should increase, and fever, or nervous irritation, should supervene, the operation had better be given up, and recourse be had to means calculated to tranquillize the local or constitutional disturbance. In some instances, the first sitting or two are well borne; but a high state of irritability of the bladder subsequently supervenes, to which the presence of fragments of some calculi appears to contribute, and which may also depend upon the sittings having been too much prolonged.

If, combined with great irritability of the bladder, there is continued pain in the hypogastric region, with fever, and mucous secretions,—if, in fact, there exists a subacute inflammation of the organ, lithotrity would manifestly be improper, and would aggravate the symptoms; but if this state appeared to be produced and kept up solely by the presence of the stone, and consequently not capable of being relieved by therapeutic means, the performance of lithotomy would be the most likely means of alleviating the symptoms, and would afford the patient the best chance of recovery; for, though the likelihood of success would, of course, be very materially diminished by so unfavourable a complication, yet

I have seen some cases where, notwithstanding the existence of fever, and symptoms of cystitis, the operation was performed, and the patients recovered. One of these, of which I took notes at the time, occurred in a boy on whom Professor Walther operated in the hospital at Munich, notwithstanding there existed symptoms indicative of a high state of inflammation of the bladder, which antiphlogistic measures failed to relieve; the patient being much emaciated and worn out by pain and sleepless nights. After the removal of the stone, which was of small size, the symptoms subsided as if by enchantment; the patient slept soundly at night, which he had not done for weeks before; and advanced towards recovery without any impediment.

A chronic state of inflammation of the mucous membrane, unaccompanied by much pain or irritability of the bladder, but attended with a copious secretion of ropy mucus, (the *catarrhus vesicæ* of old people), when combined with the presence of stone, although an unfavourable complication, is, in most cases, better suited for lithotrity than for lithotomy, particularly when the stone is of small size, as in these cases; being frequently chiefly composed of the phosphates, it is soft, and easily reduced to minute fragments. It not unfrequently happens, that the quantity of mucous secretion is diminished after two or three sittings of lithotrity; —probably from the diminution of the size or the weight of the stone by the process. When this is the case, the operation may be persevered in with great prospect of success; but should the quantity of mucus increase, and the bladder become irritable, the operation should be suspended, or altogether abandoned, with a view to the performance of lithotomy at a later period. When, however, it is deemed best, from existing circumstances, to proceed with lithotrity, the sittings should be short, and at long intervals.

A degree of inflammation of the bladder is occasionally induced by lithotrity, where none previously existed, even when the operation has been properly performed, and in proper cases; and may either depend upon the great susceptibility of the patient, the operation being attended with unexpected difficulties, or upon the nature of the stone, and the bladder being irritated by its fragments. In such a case, the operation should be discontinued, if many fragments still remained.

A condition of the bladder opposed to that of preternatural irritability, viz. atony or paralysis, is not unfrequently met with in old persons, and was at one time considered to counterindicate lithotrity, on account of the inability of the bladder to expel the fragments and detritus. Combined with atony of the bladder, there is often a considerable increase of its capacity in consequence of its being distended by the accumulated urine. The symptoms of stone are also in general much less severe, frequently very obscure, and, where paralysis of the bladder has preceded the formation of the foreign body, are sometimes absent altogether, the existence of the stone not being discovered till it has attained a large size, which usually occurs much more rapidly under these circumstances, on account of the urine being retained longer and giving rise to deposition of the phosphates. Here the peculiarities in individual cases will require to be attentively considered, in order to enable the surgeon to decide upon the most preferable mode of operating, or whether any operation be advisable; as, when paralysis of the bladder exists, the generally diminished vitality of the system or disease of other parts, might render a too active surgical interference prejudicial. When an operation is determined upon, and there is a large stone or several stones, or an enlarged prostate, which would impede the removal of the fragments, lithotomy would be preferable. In those cases, however, where the atony of the bladder is less complete, and the patient still possesses the power of voiding some urine at stated intervals, though he may not be able to empty the bladder, lithotrity would offer great probability of success, the diminished irritability which so commonly attends impaired muscular contractility, being in favour of the operation, which would be less painful and less likely to be followed by accidents; nor would the fluid injected be forced out, as often happens under other circumstances, and consequently the parietes of the bladder would be less likely to be injured by the instrument. The repeated injection, especially of cold water, is serviceable in these cases by removing the accumulated mucus, and frequently tends to restore the tone of the bladder, the contractile power of which is also sometimes increased by the stimulus of the instrumental manœuvres. Small fragments and detritus may be removed by the scoop or catheter forceps, constructed by Weiss, or by injecting water into the bladder with some force, through a full-sized silver catheter with large eyes. In these cases also, lithotrity offers a means of getting rid of the foreign body, when lithotomy would be counterindicated by disease of the kidneys or other parts; by disorder of the general health, &c. When lithotrity is performed under these circumstances, M. Civiale insists strongly upon the sittings not being long-continued, which is the more likely to happen, as, from the comparative absence of pain, the operation is generally well borne, and the surgeon is deprived of a monitor, which, if present, would warn him when to desist; and, according to the same high authority, the prejudicial effects of the sittings having been too much prolonged, would not fail to be evidenced, not so much by local symptoms, as by the supervention of a state of low fever, constitutional irritation, impaired digestion, and general health, which would frequently terminate the patient's life.

The coexistence of stone with abscess, ulceration, or fungous growths of the bladder, as evidenced by the general state of the patient's health, the frequent passage of blood, purulent matter, or portions of fleshy substance with the urine, is generally considered so absolutely to counterindicate any operation, that I need not do more than allude to these morbid states. Blood or purulent matter in the urine may, however, come from one of the kidneys, from abscess of the prostate, or of the perineum, or from the surface of the urethra, and an operation for the removal of the stone may nevertheless be practicable with advantage. In these cases the surgeon must be guided by the concomitant circumstances in his choice of the method to be adopted.

When disease of one or both kidneys is known to exist, few persons would recommend lithotomy, as it would be attended with but slender chances of success, for, even were the patient to survive the operation, the existing disease would in all probability be aggravated, and cause his death at no distant period. In some cases of this description, lithotrity might be had recourse to with advantage, the shock to the constitution being comparatively small, and the irritation from this operation being less likely to extend to the diseased organ.

Having thus noticed some of the conditions which appear to indicate when one or other of the operations should be preferred, as far as the stone itself and the organs principally implicated are concerned, I must not omit, before concluding, to allude to the state of other organs, and the general condition of the patient, which must often exercise great influence on the choice of the operation, and in enabling the surgeon to determine whether either could be performed with a prospect of advantage.

The existence of organic disease of important parts, even when not immediately tending to shorten life, is generally considered a sufficient reason for abstaining from the performance of any serious operation, especially of lithotomy, which, by the shock imparted to the system, would not fail in most instances to aggravate the existing disease, and even render recovery from the immediate effects of the operation extremely doubtful. Hence many patients with stone who at the same time laboured under chronic disease of the abdominal or thoracic viscera, bronchial irritation, asthma, &c. were, previous to the invention of lithotrity, condemned to retain the stone in their bladder, and to endure the suffering from this disease, without a prospect of its removal. Such persons may now reasonably indulge the hope of a cure by means of lithotrity, with comparatively little risk, when other circumstances admit of its application, as, except where there exists much constitutional or local irritability, the effects of lithotrity are mostly confined to the parts implicated, and are not generally extended to distant organs, when the operator is careful to suspend the operation should any unpleasant symptoms arise, till they have subsided.

The same remark may apply to those persons in whom, though there be no evident disease of any important organ, the general health is materially impaired, either by a residence in tropical climates, or other causes, and in whom there consequently exists a great predisposition to disease, which would very likely be called into activity by the performance of a capital operation. In the majority of such cases lithotomy, though not so strongly counter-indicated as when there is actual disease, would yet be attended with great risk, and would be less advisable than lithotrity; particularly if other circumstances be in favour of this operation. In some persons, however, even when the symptoms of stone are not severe, a deranged state of the general health, and digestion, with feverishness and restlessness, depends upon the presence of the foreign body, and would be rectified on its removal; while the irritation from lithotrity, especially if many sittings were required, would be likely to be prejudicial. In such a case, therefore, lithotomy would be the preferable method if other circumstances did not preclude its adoption.

I have already adverted to the prejudicial effects which may ensue from the undue degree of apprehension entertained by some patients of lithotomy, which most persons are aware, if it do not succeed, will probably cause their death. So great is the dread of some patients of lithotomy, that they are induced to bear their sufferings, and tamper with the disease for a long period, till the stone has attained a large size, or till morbid alterations supervene, which either preclude an operation for their relief, or render its performance much more hazardous. To such persons the less formidable operation of lithotrity might often be proposed, without exciting their fears in the same degree, and at an early stage of the disease, when its removal would be comparatively safe and easy. In some instances, where the patients were particularly apprehensive of lithotrity, but found after two or three sittings that it was not so formidable as they supposed; and after seeing some fragments pass away with but little inconvenience, their minds became much more easy as to the result, which had the happiest effect in improving their general condition, and raising their spirits. In order, however, to prevent the despondency that might arise, in the event of any unfavourable circumstances supervening, it would be advisable on the part of the surgeon, not to lead the patient to think too lightly of the operation, but to intimate that it is sometimes necessary to suspend the sittings for a time, without any harm necessarily resulting from the delay.

When treating of the nature of calculi, as regards the operation best adapted for their removal, I alluded to the calculous depositions formed around a foreign substance accidentally introduced into the bladder from without; and although these cases are rare, they occasionally become the subject of operation. The substances most likely to be left in the bladder, and to form the nucleus of a calculus, are, portions of elastic gum or wax bougies, of catheters, or of lithotritic instruments, when these have been badly constructed and an undue degree of force has been used in operating. Vegetable matters, as pieces of wood, straw, peas, &c. are occasionally introduced into the bladder, especially by females. It cannot always be known, however, what is the nature of the foreign body, when it has been passed by the patients themselves, as they are generally reluctant to give any information on the subject; but, when it can be ascertained that it is a soft or friable vegetable substance, lithotrity would in most cases be the preferable operation, as the concretions formed around such nuclei are mostly composed of the phosphates, and the operation has been successfully performed in some similar cases. On the other hand, should a portion of an instrument, or any other hard substance have been left in the bladder, lithotrity would generally be of little avail; and lithotomy should be performed as early as possible, as the longer it is delayed the larger would be the calculus, and the risk of a diseased state of the bladder greater. It is not always, however, an easy matter to find and extract the foreign body after the bladder has been opened; particularly if its shape be long and narrow. In an operation performed by one of the most skilful surgeons of Paris, at which I was present some months ago, considerable difficulty was experienced in extracting the foreign body by the lateral operation, which lasted a long time. The calculous deposition had in this instance, formed around a piece of tobacco pipe, about two inches and a-half in length, which was repeatedly seized by the forceps in a direction transverse to the wound, which occasioned the difficulty in its removal.

The remarks, which I have hitherto made, have more especially reference to the selection of an operation in adult males, or those above puberty; but a very large proportion of stone cases, especially in hospital practice, occur in young children, or those below the age of ten or twelve years. In these subjects few persons would recommend lithotrity as a general method, as it is attended with great inconvenience and risk, on account of the narrowness of the urethra, which would necessarily require the instruments to be of a slighter construction, while there would not be a proportionate friability of the stone, which, in children, is mostly of the lithic acid or oxalate of lime varieties. On this account, also, the treatment must be longer than in adults, as the fragments would require to be broken smaller to enable them to pass away; and, owing to the textures at the neck of the bladder being less resisting, this part is in children more dilatable, and would admit the entrance of portions of stone too large to pass through the rest of the canal. There are, besides, other objections to lithotrity in children, as the greater degree of susceptibility of their nervous system, and of irritability of the parts, which would render the repeated introduction and action of instruments in the bladder liable to be attended with serious consequences. On the other hand, all the conditions are most favourable for lithotomy in young subjects, and it is successful in the great majority of instances, the stone being frequently removed in two or three minutes, while the symptoms (which are generally induced by its presence, and not dependent upon previously existing disease), most usually subside after the removal of their cause. The operation being comparatively easy of performance, owing to the trifling depth of the perineum, which enables the operator readily to reach the interior of the bladder with his finger, and generally to touch the stone, is also a principal cause of success; added to which, the patient's moral constitution is not disagreeably affected, with respect to the result of the operation, as is often the case in adults. Hence, it is obvious that in general lithotomy is in an especial manner the operation best adapted to children affected with stone; yet, even under the most favourable circumstances, the operation is fatal in a certain proportion of cases, which may be seen from the tables in the appendix, so that even in children lithotrity may be the preferable operation in some instances, as when the stone is small and likely to be destroyed in two, three, or four sittings, and where there is not much irritability of the parts on the introduction of instruments. It has been several times performed on children with success, both in England and abroad; but I am not aware that in any instance it has been attended with a fatal result. Of the cases which have come to my knowledge, the youngest patient on whom lithotrity was performed was forty months old. M. Segalas was the operator on this occasion, though few persons would be inclined to follow his example on so young a subject. In proportion, however, as the patient approaches nearer to puberty, lithotrity might be performed with greater prospect of advantage.

Stone cases in females being of rare occurrence compared with their frequency in males, the question relative to the operation to be preferred in them resolves itself into a very narrow compass. In fact, the shortness, width, and great dilatability of the urethra in women, admits of the passage or extraction of calculi, which in the other sex would require an operation of lithotomy or lithotrity for their removal; and when one of these operations becomes necessary, the surgeon will not experience much difficulty in determining to which the preference should be given. Lithotomy, though attended with comparatively little difficulty or danger in females, is so frequently followed by incontinence of urine, or fistula, that it would seldom be advisable to prefer it to lithotrity, which, from the simpler disposition of the female parts, in general, admits of easy application, and would be little likely to be followed by the more serious consequences to which I have adverted. At the same time, it must be borne in mind, that in many women, as in children, there is much greater susceptibility of the parts and of the nervous system than in men; and when this is the case, the action of lithotritic instruments may be followed by high local, or constitutional irritation, which might render a repetition of the sittings, not without danger. When, therefore, combined with this condition, there exists a large or hard stone, attended with severe symptoms, and which would be likely to require many sittings of lithotrity, it would be preferable at once to remove it by lithotomy.

From a consideration of all the preceding circumstances, the following conclusions may be deduced:

1*stly*, That lithotomy is still, in the present state of the art, the operation most suited to the majority of cases of stone in the bladder; inasmuch as about one-half of the number of stone patients consist of children to whom, with a few exceptions, it is more particularly adapted.

2dly, That, as far as adults and elderly persons are concerned, lithotrity is most applicable to an equal, if not to the greater, number of cases.

3dly, Lithotrity is preferable in the great majority of female patients.

4thly, Other circumstances being favourable, lithotrity is more especially suited to calculi of small size, even when hard.

5thly, Lithotrity is less applicable than lithotomy to most cases, where the bladder contains several calculi, especially if they be hard.

6thly, Lithotomy is the preferable, and often the only admissible operation, in cases of large calculi; as also in those cases where the stone, though only of moderate size, is yet of considerable density, and irregular on its surface, as in the oxalate of lime variety

7thly, When there exists much irritability of the urethra and bladder, which cannot be allayed by preparatory treatment, lithotomy would be the preferable operation; especially if the irritability appeared to be chiefly dependent upon the presence of the stone.

8thly, Lithotrity is applicable in some states of deranged health, or disease of parts, which would counterindicate lithotomy, or would render its performance most likely to be attended with failure.

9thly, The degree of pain from the performance of lithotrity is not great in many cases, and is mostly diminished after the first sittings; but, on the other hand, in some instances, the operation is very painful, and the pain becomes increased in subsequent sittings, though, perhaps, never so acute in lithotrity as in lithotomy, yet, as the pain in the latter operation lasts only for a few minutes, whereas in the former it recurs, though less in degree, on each sitting, the patient frequently suffers by lithotrity a greater amount of pain.

10thly, The duration of the treatment is generally longer by lithotrity than by lithotomy, though sometimes it is shorter; and after the stone has been removed by the latter operation, the patient, though confined to his bed, may, during the greatest part of the period, be considered as convalescent; whereas, when lithotrity is performed, there is always a risk, so long as any fragments remain in the bladder, of circumstances arising to prevent the completion of the operation, and the patient cannot be regarded as out of danger.

11thly, When lithotrity is applicable, the method by pressure is, in the great majority of cases, infinitely superior to that by percussion.

12thly, Lithotrity exposes more to the risk of a relapse than lithotomy, on account of the greater probability of a portion of stone having escaped detection, and remaining in the bladder after the operation.

Lastly, Sufficient data do not as yet exist whereon to form any accurate estimate of the average amount of failure, and mortality after lithotrity; the accounts hitherto furnished being of a very contradictory nature; some representing lithotrity as more successful in its results than many slight operations; others stating the number of failures to be very great. The circumstance of several unsuccessful cases, which were not adverted to by the operators, having been subsequently brought to light, both in England and on the continent, tends very much to discredit some of the statements of success which have been made; though, as far as the results are concerned, much must depend upon the operators being accustomed to the use of the instruments, and knowing when to desist from persevering in the attempts; as also upon the selection of proper cases. It is, however, satisfactory to know, that, since the instruments have become more simple and perfect in their construction, and the operation better understood by the generality of practitioners, the proportion of failures is much less than at an earlier period.

APPENDIX.—The following few cases are selected, in order to illustrate some points connected with lithotrity; the difficulties which sometimes arise, and the occasional causes of failure. I might have added others, both from what has fallen under my own observation, and also from other sources, which would have represented lithotrity in a much more favourable light; but a repeated narration of simple and successful cases, where no circumstances have occurred materially to retard recovery, would have been but little instructive; and I therefore prefer to notice such as are more interesting in a practical point of view.

I have subjoined some statistical accounts of the average mortality after lithotomy, in different localities; and have commented upon the difference which exists in this respect between England and the continent.

ILLUSTRATIVE CASES OF LITHOTRITY.

Simple case; cure in one sitting.—A member of the Chamber of Deputies, aged 53, had laboured under symptoms of stone for a year. The urethra and bladder were healthy, and not very irritable. The stone, which was judged to be about the size of an almond, was crushed without difficulty by M. Civiale, with the curved lithotrite, and the fragments were also broken in the same sitting. The detritus passed away readily; the patient suffered but little pain from the operation. No subsequent sittings were required, and he returned to the country cured, a month after his arrival in Paris.

Cure in one sitting by Jacobson's Instrument.—M. C. had suffered during eight months from symptoms of stone, and on sounding, several small calculi were detected. After a few days preparatory dilatation of the urethra, Jacobson's instrument was introduced, and some of the calculi were crushed. Several fragments and small calculi passed away after the operation, and on a subsequent examination, no remains of stone could be felt. This patient was not apprised that the operation was about to be performed, but thought the instrument was passed in order to examine the bladder, and when it was withdrawn, inquired of the operator if he thought lithotrity applicable to his case.

Large and hard Stone.—The Count de L——, who had a hard stone in the bladder, measuring thirteen lines in its long diameter, was lithotritized by M. Amussat, in February 1834, by the method of percussion. No unpleasant symptoms ensued, and a second sitting took place four days afterwards, which lasted ten minutes; several fragments being broken. The urine, which was tinged with blood after the first sitting, was perfectly clear after the second and subsequent ones, which were also attended with less pain and inconvenience than the first. The fragments passed away readily; and as no remains of stone could be felt in examining the bladder, the Count was enabled to resume his usual avocations, and to take all sorts of exercise without inconvenience.

Irritability of Urethra and Bladder, &c.—F. H., aged 46, had been subject to attacks of pain in the region of the kidneys, from 1814 till 1832, and had, during the latter part of this period, experienced symptoms of stone, the existence of which was verified by sounding; but there was extreme irritability of the parts on the passage of the instrument. The urethra was, however, dilated by the use of elastic gum bougies, and the irritability became, in some degree, allayed. M. Amussat then made an exploration of the bladder with the lithotrite, which was followed by an attack of fever with nervous symptoms, and prevented the operation from being attempted till eight days afterwards, when the stone was seized and broken by percussion into several fragments. After the third sitting, the patient was seized with an attack of piles and general weakness. The bladder had also lost its energy, and could not expel the fragments. A long interval was consequently requisite between each sitting, but after several sittings the stone was destroyed, and the patient felt himself in better health than he had done for twenty years before.

Abscess of prostate, and retention of urine. Relapse.—M. D. aged 71, had laboured under stone in the bladder for a period of two years, when lithotrity was performed with the three-branched straight instrument. The stone, about the size of a walnut, was broken at the first sitting, though the bladder contracted strongly, and expelled the fluid which had been injected. At the second sitting considerable difficulty was experienced in the introduction of the instrument, inflammation and abscess of the prostate gland supervened, causing retention of urine, which was relieved by the abscess bursting into the urethra. After a month's interval, the operation was repeated, though it was still requisite to draw off the urine with the catheter, through which the detritus of the stone came away. When the patient had undergone six sittings, no remains of stone could be felt; but at the expiration of six months, a fresh one was detected, which was also broken, and the fragments extracted by instruments. M. D. enjoyed good health during the two subsequent years, though the retention of urine remained. (Leroy D'Etiolles.)

In all probability these accidents would not have occurred, if this patient had undergone the operation after the introduction of curved instruments into practice.

Complicated and unfavourable Case.—The Chevalier del Turco, aged 60, was operated upon by M. Civiale in Florence in 1835. He had long laboured under stricture of the urethra, and was in the constant habit of using bougies. In 1833, vesical catarrh, and other symptoms of a peculiar character supervened, which increased to such an extent as to render walking or the motion of a carriage insupportable. At the time of M. Civiale's arrival, the patient had not quitted his bed for more than four months, which circumstance rather surprized him, as, from the letter he had received, he expected to find the patient in a more favourable condition. The friends, however, avowed that they had considered it necessary to represent the case in a favourable light, in order to induce M. Civiale to come to Florence and undertake it. There also existed enlargement of the prostate; a muco-purulent secretion from the bladder; a severe bronchial affection, with irregular and intermitting pulse, feverishness, sleepless nights, loss of appetite, great debility, emaciation and dejection of mind. These circumstances appeared to render an operation inadmissible, and though, on examination, the stone was considered to be of small size, yet the bladder was exceedingly irritable, and its internal surface irregular. Some of the first surgeons of Florence had declared lithotomy to be inapplicable with a prospect of success; and that if the case were left to itself, the patient could not long survive, so that lithotrity was proposed as a last and extreme resource. The first sitting, on the 21st of April, was very short, but the stone was broken with the curved lithotrite. The patient having suffered less than he anticipated, and some fragments having passed through the catheter, tended to raise his spirits, and to give the operator greater hopes of a successful result. A second sitting took place on the 30th, without any other inconvenience than the arrest of a fragment in the urethra, which was pushed back into the bladder. Two other sittings took place on the 2d and 4th May, which passed off as favourably as the others. The urine afterwards became clearer, and the local suffering much alleviated. Fragments and detritus were occasionally arrested in the urethra, but were displaced without difficulty, either by means of injections, or by being pushed back into the bladder. The patient underwent three other sittings on the 6th, 8th, and 11th, which were very short, and attended with less pain and inconvenience on each repetition. On the 15th, he was able to quit his room and take exercise in a carriage, and on the following day no remains of stone could be felt in the bladder.*

Portion of an Instrument left in the Bladder ; Lithotomy after Lithotrity in a Child.—The patient was a boy aged 4 years. The stone was broken with facility, but at the third sitting a portion of the instrument was observed by the operator to have been broken off and left in the bladder. He was, however, so fortunate as to be able to extract it with a fresh lithotrite. A fragment of calculus afterwards became arrested in the urethra, and considerable difficulty was experienced in pushing it back into the bladder. The bilateral operation was subsequently performed, and was attended with success.

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* "Parallele des divers moyens de traiter les calculeux."—When at Florence last year, I learned that, after M. Civiale's departure, this patient had a recurrence of the disease, and was again lithotritized with success.

Cystitis consequent upon exploration of the bladder. Mr M., aged 60, of a nervous and irritable teperament, had laboured under symptoms of stone during three years, when an examination of the bladder was made with a common sound, which detected a stone, but which was attended with considerable pain, and irritability. A subsequent examination of the lithotrite was succeeded by fever, high nervous irritation, and inflammation of the bladder; the urine being expelled frequently, with great pain, and containing a large quantity of muco-purulent matter. This state continued during several months, the patient retaining the stone, as there was no prospect of his being able to undergo lithotrity with advantage.

Cystitis with fatal result from attempts at Lithotrity.—A young man, aged 19, was operated upon at the Hospital Beaujon, with the three branched perforating instrument. On the first attempt the stone could not be seized, and considerable pain was occasioned. A second trial was even attended with more pain than the first, and was equally unsuccessful in seizing the stone. Shivering, fever, pain in the hypogastric region, and other symptoms of cystitis supervened, and the patient died on the fourth day. On examination the bladder was found to be considerably inflamed, particularly about its neck, and contained a mulberry calculus of the size of a walnut.

This case was evidently not at all adapted for lithotrity, and least of all by the method of perforation. Had lithotomy been performed in all probability the result would have been different.

Fatal result from attempt at Lithotrity.—The presence of a stone in the bladder of M. P. was ascertained by sounding, but a subsequent attempt to seize it with Heurteloup's instrument failed; and a high degree of irritability of the bladder supervened, which terminated in inflammation, and caused the patient's death in fifteen days.

Fatal result of Lithotrity.—Lecomte experienced such serious nervous symptoms after the first trial of lithotrity that he died on the third day. (Larrey's Report of Cases.)

Violent Contractions of Bladder. Lithotomy after Lithotrity, with fatal result.—M. R. had experienced symptoms of stone for several years, and at length placed himself under the care of M. Civiale, in order to undergo lithotrity. The stone was seized at the first sitting, though not without difficulty. The three next sittings were altogether fruitless, the stone could not be seized, and M. Civiale gave up the case. M. Leroy was called in some time afterwards, and found the stone to be about twenty lines in diameter, the bladder hypertrophied and contracted, and the prostate greatly enlarged. These unfavourable circumstances, and the case having been given up by M. Civiale, would have determined M. Leroy not to undertake the treatment by lithotrity; but, yielding to the patient's earnest wishes, he performed the operation ; a strong solution of opium having been previously injected into the bladder. Though this was found to be altogether useless in preventing the contractions which expelled the fluid on the introduction of the lithotrite, which was so strongly grasped that it could not be moved in the bladder, and after a short period was withdrawn, the stone not having been seized. At a subsequent sitting, undertaken by M. Heurteloup, the stone was seized, but the instrument could not be made to act upon it, and the patient suffered considerably ; yet, notwithstanding these reverses, he was not discouraged, and again supplicated M. Leroy to repeat the operation. This he declined doing, and recommended lithotomy, as the patient's sufferings had become intolerable. This operation was consequently performed, and a quantity of pus escaped from an abscess in the prostate, at the moment of incising the neck of the bladder. The symptoms were not relieved by the extraction of the stone, and the patient died twelve days after the operation. The stone was of an oval shape, from eighteen to twenty lines in diameter, and had only been perforated once by the lithotrite. The prostate gland was nearly the size of an orange, and the parietes of the bladder nearly three lines in thickness.

From the disease of the parts, and the size of the stone, this was evidently one of the cases least adapted to lithotrity, especially the method by perforation.

Lithotrity on a female.—A woman, aged 28, who had suffered from stone for eight months, was lithotritised by M. Breschet, with the curved instrument, on the 15th October 1837. The sitting was not attended with much pain, and several fragments subsequently passed away. At a second sitting the stone was again broken without difficulty, and the pain was less than before the operation ; on the 2d November a third sitting took place, which was attended with no inconvenience, and was succeeded by the expulsion of several fragments. On examination two days afterwards no remains of the stone could be felt.

Lithotrity on a boy ; *arrest of fragments* ; *long duration of treatment.*—A boy aged 13, had suffered from stone for some years, and was also subject to nephritic pains, which were sometimes very acute. His urine was often milky and loaded with mucus. Two calculi about the size of large almonds, were detected in the bladder by an examination, and, as the patient and his friends strongly objected to lithotomy, lithotrity was performed by M. Civiale, with a three-branched instrument of a size proportioned to the age of the patient. The sittings were repeated every second day, and, from the size and hardness of the stones, their number was greater than was anticipated. Fragments were also frequently retained in the membranous portion of the urethra, whence they were removed with considerable pain and difficulty. After four months treatment the patient was completely cured.

It is obvious, that, though in this case lithotomy would have been the preferable operation, lithotrity would have required much less time, if performed at a period when curved instruments were used.

Lithotrity on children; arrest of fragments in the urethra, &c.—A boy aged 4 years, was lithotritised at the Hospital de la Faculté with the three-branched instrument. The stone was nearly an inch in diameter, and though brittle required six sittings for its removal. The fragments stuck several times in the urethra, and occasioned a good deal of suffering. The patient, however, was completely cured.

Another boy had suffered from symptoms of stone for more than one year. On examination a stone of about the size of a filbert was felt in the bladder, and partially engaged in the urethra. After having been pushed back into the bladder, it was crushed with the lithotrite. A fragment became arrested the next day in the urethra, and occasioned acute pain. A similar accident recurred two days afterwards, and great difficulty was experienced in pushing back the portion of stone into the bladder. The indocility of the patient prevented any subsequent introduction of the instrument, so that in all probability the stone remained.

In another young patient, 3 years old, the stone was only three or four lines in diameter. It was crushed in one sitting, and the fragments passed away without inconvenience.

A little girl, 3 years old, had laboured for more than two years under symptoms of stone. On examination a stone was detected, which was supposed to consist of phosphate of lime. The operation was performed by M. Segalas, though not without difficulty, as the child was very intractable; the contraction of the bladder expelled the fluid, injected and prevented the instrument from being opened. The stone was destroyed in ten sittings.

Deranged general health; catarrhus vesicæ, &c.—A gentleman, aged 74, had for years laboured under symptoms referred to the bladder, without being characteristic of stone; but on examination, at least two calculi of a certain size were ascertained to exist in the bladder; and the patient arrived in Paris in May 1835, greatly debilitated, suffering much, and with frequent inclination to make water. The urine was fetid, and contained a large quantity of mucus. He was feverish, and did not sleep at nights, and the urethra was very irritable. After his health had been improved by tonics, and the irritability of the bladder lessened by bougies, lithotrity, of which the patient was very apprehensive, was performed by M. Civiale, the three-branched instrument being used. The first sitting was short, and only one of the calculi was broken. No accident supervened; a large quantity of detritus passed away, and the patient's fears were very much lessened. Four or five other sittings sufficed to remove the calculi. After the first few days of the treatment, the *catarrhus vesicæ* diminished, and at last ceased entirely, and the patient's general health improved in proportion as his anxiety became less.

Complicated and unfavourable case; numerous calculi.—One of the most interesting cases in which lithotrity was performed is that of M. B., operated upon in 1831 by M. Civiale, who has given the details of the case in his "Parallele." This gentleman was 66 years of age, and had laboured during four years under bronchial disease, and attacks of *catarrhus vesicæ*, which increased in intensity on each succeeding occasion, the urine being purulent, fetid, and bloody. The bladder was examined by sounding, and the existence of stone ascertained. The patient consequently came up to Paris from Lyons, in order to undergo lithotrity. An exploration of the bladder indicated the presence of several small calculi, and, though it caused but little pain at the time, was succeeded by swelled testicle, increased pain, and mucous secretion from the bladder, nausea, and slight fever. The remedies employed relieved the general symptoms, but the urine continued to be loaded with a brownish fetid secretion, and the bladder had not the power of emptying itself. Injections through a catheter three times a day with tepid water rendered the urine clearer; the urethra, however, continued exceedingly irritable, and sometimes contracted on the instrument, so as to prevent its passage. On the 4th December, the three-branched lithotrite was introduced, and some of the calculi were crushed, none of them being larger than a bean. No inconvenience ensued, but only a small proportion of the fragments of the crushed calculi came away, owing to the loss of tone of the bladder. On this account, after the subsequent sittings, the fragments were extracted, one by one, with an instrument, though not without considerable pain and difficulty, arising from the irritability of the urethra. By the middle of May eighty-two entire calculi, and twenty-five or thirty after having been crushed, were removed. They were all composed of uric acid. The patient's health gradually improved, and injections of cold water restored the contractile power of the bladder, so that on the 21st of May, he was able to return to Lyons, in a most satisfactory state.

Unsuccessful Case.—The Comte d'A. was considered to be in a very favourable state for lithotrity, which was accordingly performed by the method of percussion. Far from complaining of pain during the first sittings, the patient used to say that the sound of the blows from the hammer upon the instrument was most agreeable to his ear. After the sixth sitting, however, the pain became so intense, that the patient was tormented with continual tenesmus, and could neither retain his feces nor his urine. His sufferings continued till his death, after which calculi were found both in the bladder and kidneys.

Failure of Lithotrity ; subsequent Lithotomy.—A lad, aged 17, was sent from the country to Paris to undergo lithotrity. Although the parts were very irritable, the stone hard, and not of small size, he refused to submit to lithotomy, to which he was strongly urged by his surgeon, M. Velpeau. Lithotrity was consequently performed at La Charité. The sitting was attended with a good deal of pain, and was followed by fever and nervous irritation. Two or three fragments passed away, and showed that the stone was composed of oxalate of lime. Several other sittings took place at long intervals, though with no advantage, being generally followed by serious symptoms, and the arrest of fragments in the urethra, so that the operation was given up. The patient was afterwards lithotomised, and recovered.

In similar instances, the cause of failure cannot be fairly ascribed to lithotrity ; but to the case not being at all adapted for the operation.

Tables exhibiting the proportionate composition of urinary calculi.

The composition of 141 calculi, analysed by M. Chevallier of Paris was as follows :

Uric acid, and urate of ammonia,	121
Phosphate of lime,	8
Ammoniaco-magnesian phosphate,	7
Phosphate and oxalate of lime,	1
Uric acid and phosphate,	3
Oxalate of lime,	1

In 32 other calculi, analysed by the same chemist, the proportion was :—

Uric acid, or urate of ammonia,	20
Phosphatic,	2
Phosphate with nucleus of uric acid,	2
Uric acid and phosphate,	5
Phosphate mixed with carbonate,	1
Oxalate of lime,	2

The analysis of 64 others exhibited the following composition.

Uric acid, and urate of ammonia,	52
Phosphate of lime,	6

Ammoniaco-magnesian phosphate, -	4
Oxalate of lime, - - -	2

The following shows the composition of 100 calculi passed by the urethra, which, not having remained long in the bladder, accounts for the small proportion of the phosphatic varieties.

Uric acid, or urate of ammonia, - -	72
Uric acid and oxalate of lime, -	9
Oxalate of lime, - - - -	14
Triple phosphate and fusible, - -	4
Carbonate of lime, - - -	1

The proportion of uric acid calculi would appear to be less in England, which may possibly depend on the difference of climate and mode of living. Thus in the Guy's Hospital collection, the uric acid calculi are stated to be in the proportion of 22 to 87; in the Norwich collection, as 66 to 181; in that of Manchester, as 71 to 187, without including 39 others composed of uric acid and phosphate. In Hunter's and Sir E. Home's collections, they are as 61 to 150; in the Bristol collection, as 73 to 218. It may be said that, as these entire calculi had not been analysed, their interior composition could not be known. But Dr Prout, who analysed 823 calculi, found that the uric acid ones were not much above a third of the whole, viz. 294, of which 98 were almost pure uric acid; 6 uric acid with a little oxalate of lime; 43 uric acid with a little phosphate; that 113 consisted of oxalate of lime, 3 of cystic oxide, and 202 of the phosphates; while 186 were of the alternating kind.

Table of results of the bilateral operation on persons at different periods of life, from Dupuytren's work, published after his death.

Sex.	Age.		Number of operated.	Died.	Cured	Average Mortality.
Males.	1 to	10 years.	19	1	18	1 in 19
	10	20	5	1	4	1 5
	20	30	3	1	2	1 3
	30	40	2	1	1	1 2
	40	50	3	0	3	0 3
	50	60	2	1	1	1 2
	60	70	4	4	0	4 4
Females.	10	20	1	all cured.		
	30	40	1			
	40	50	2			
Total. from 1 to 70 years,			42	9	33	1 in 4⅓

This operation, performed by other Parisian surgeons, was attended with about the same average mortality as above. Thus of 89 patients, 19 died and 69 recovered, the proportion being about 1 in 4⅔. It will be seen that, as in the lateral operation, the number of deaths is small in children under ten years of age, and very great in advanced life.

Average mortality after Lithotomy in England and France.

—Dr Yelloly, in his statistical table of 649 operations, performed at Norwich, states the proportion of deaths on the whole, as about 1 in 7, and as 1 to 14 in children under fourteen years of age. The table of 704 operations performed in the same town, given in Mr Crosse's work, shows that 93 were fatal cases, or less than 1 in 7. At Leeds there were 28 fatal cases in 197 operations, being about the same proportion as at Norwich. At Bristol, however, the mortality is greater. According to Mr Smith's table, given in the Medico-Chirurgical Transactions for 1821, being 79 in 354 operations, or one in $4\frac{6}{8}$; notwithstanding nearly half the number were patients under ten years of age, in whom the mortality appears to have been unusually large, viz. 1 in $4\frac{1}{8}$, which is difficult to be accounted for.

According to the valuable statistical tables appended to M. Civiale's recent work,* it appears that, from 100 operations of lithotomy, performed at the Hotel Dieu between 1808 and 1830; of which 32 were operated by the bi-lateral, 12 by the recto-vesical, and the rest by the lateral method; there resulted 28 deaths; being more than 1 in 4, though nearly half the patients were children. At La Charité, the mortality is considerably greater; 70 patients were operated from 1806 to 1831; and the number of fatal cases amounted to 35 or one-half. Among these patients, however, there were only five children, the rest being adults and old people. Another statement shows the result of 190 operations performed by various Parisian surgeons. Of these patients, 106 died, being more than half, and, notwithstanding the greater number were old men, the recoveries were more frequent in them than in the others. Thus there were 21 children; 10 of whom died; but of 59 adults 39 died; while of 102 old people, only 62 died.

Another account states that, of 1002 patients at various periods of life, on whom lithotomy was performed in the Parisian hospitals, 323 died, or little less than 1 in 3.

Again, of 2368 patients on whom operations for the stone were performed in hospital and private practice in France; 1264 of whom were children, and 93 women, 374 died, or about 1 in $6\frac{1}{3}$ of the whole; while 109 relapsed or were incompletely cured. If, from the whole number, we deduct 314 patients lithotritised, (304 of whom were said to be cured), and 50 whose calculi were extracted by the urethra, (48 of whom were cured), we shall have remaining 2004 who were cut for the stone, of which number, 362 died, making an average mortality of about 1 in $5\frac{1}{2}$.

Another statistical account, quoted by the same distinguished surgeon, demonstrates that, of 4672 operations of lithotomy, (lateral, bi-lateral, hypogastric, and recto-vesical,) performed in different parts of Europe, excluding England, 968 were followed by death, being 1 in 4⅘.

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* "De l'Affection Calculeuse."

I think I may aver, without fear of contradiction, that, among an equal number of patients subjected to lithotomy in the British isles, the average mortality would be found to be much less considerable than that exhibited by the above statements of the result of this operation abroad; as in fact, may be considered proved by the Norwich, Leeds, and Bristol tables. It would seem difficult to assign a reason why the success should be greater in this country than on the other side of the channel, as the French are in general not less skilful operators than the English. But my opportunities have enabled me to ascertain that the ratio of mortality, not only after lithotomy, but also after other operations, is much greater on the continent (especially in hospital practice), than in England. This circumstance, I have no hesitation in ascribing to patients being with us, brought into a better state, by attention to their general health, &c. to support an operation, before they are subjected to it; and also to the superior after-treatment pursued in England; by which the consequences so frequently causing failure on the continent, are prevented, or remedied. The contrast between the mortality after lithotomy on the continent and in the British dominions, is illustrated in a table which M. Civiale has given, to show the average mortality according to the age of the patients. Thus, from 540 operations of lithotomy, performed on children, in different parts of the continent, there ensued 109 deaths, or 1 in 4¾, and 33 incomplete cures. Of 430 individuals between fourteen and sixty years, 104 died, and 51 were incompletely cured. Of 200 persons above sixty years of age, 123 (near five-eighths) died, and 19 were incompletely cured. The same table includes the result of 16 cases of lithotomy, performed in Ireland, which are as follow. In 12 children no deaths and only two incomplete cures from incontinence of urine; 3 adults—all cured; and one old man, also cured. These may, it is true, have been all favourable cases; and that, in sixteen other cases, the deaths might be in greater proportion to the cures; as it is not unfrequently the case that an operator has a succession of successful cases, and in another series of patients that several failures occur; but it is just as likely, on the other hand, that the greater amount of success is to be attributed to the causes which I have specified.

Explanation of the Engravings of the Lithotritic instruments most frequently employed.

No. 1. Lithotrite constructed by Weiss. A. the cross handle, which may be removed by loosening the screw B; C. the thumb-piece, by which the inner branch may be moved backward and forward. D. the screw with a fly handle which, being turned round, forces the collar E upon the moveable or inner blade, and crushes the stone. F, the percussion rod, the flat end of which, being struck with the hammer, forces the inner blade forwards upon the stone.

No. 2. Lithotrite constructed by Charrière, by which also, percussion or pressure may be employed. *a.* convex fixed branch; *b.* concave moveable branch; *c.* round handle of screw; *d.* button with knobs turned transversely, so as to allow the concave branch to slide freely backwards and forwards within the convex one, thus serving for percussion; *e.* the screw; *f.* expanded portion of handle whereon to apply the thumb while holding the instrument with the stone in its grasp.

No. 3. Front view of the same instrument, showing the aperture in the extremity of the convex branch, to allow the escape of detritus, (also seen in Weiss's instrument) and the knobs on the button turned perpendicularly, as a fixed point for the screw, for the employment of pressure; also *g.* the graduated scale of lines to indicate the diameter of the stone when seized.

No. 4. The screw scoop for breaking small calculi and fragments.

No. 5. The catheter forceps for the removal of fragments and detritus. The blades are hollowed out for the purpose of containing the fragments, and of allowing injections to be made.

No. 6. New instrument, as well as the two former constructed by Weiss, for breaking fragments lodged in the urethra. A, the central rod, the branches of which are represented expanded on the canula; B, being drawn back; C, head of the perforator.

Art. III.—*Amaurosis from an excess of circulating blood, affecting the visual nervous system generally. (Hyperæmial Amaurosis.) Active, passive, mechanical, and sympathetic forms: explaining their symptomatology, causation, diagnosis, pathology, and treatment.* By Edward Octavius Hocken, M. D., M. R. C. S. L., F. R. M. C. S. &c.*

In the hyperæmial variety of amaurosis, the loss of function is dependent on preternatural fulness of the blood-vessels of the visual nervous system generally. It occurs under different forms, and presents diversities, both in its local and general symptoms. It may be regarded, in fact, as a generic term, comprehending very different affections, all of them presenting in common either the indications of active or passive hyperæmia of the optic nervous apparatus, with diminution or suppression of the visual powers. This variety of amaurosis is then divisible itself into the following forms: viz. active, passive, mechanical, and sympathetic; and these include subdivisions expressed in the following table:—

HYPERÆMIAL AMAUROSIS.

1. Active.

{ 1*st.* From active or absolute general plethora.
{ 2*d.* Local determination of blood.

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* Vide Author's papers, Lancet, pp. 713-16, 775—779, 916—919.

a. from accidental causes
b. from hypertrophy of the left ventricle of the heart.

2. Passive.

1st. From relative or passive plethora, &c.
2d. Venous congestion (accidental.)
3d. The effect of previous inflammations, injuries, &c.

3. Mechanical.

1st. Venous retardation from the pressure of tumours, &c.
2d. From disease of the heart and great vessels.

4. Sympathetic.

1st. Sympathy with connected organs. *

Active hyperæmial amaurosis from general plethora.—The term active plethora supposes a condition of the vascular system in which the quantity and quality of the blood are morbidly increased in relative proportion to the containing vessels and the system generally. During the early continuance of this constitutional condition, there is an exuberance of health denoted by the full frequent pulse; the free, vigorous capillary circulation; the increased nutrition, and great activity manifested both in the secreting and excreting organs; hence the individual becomes more or less robust, the muscular system is developed, chiefly seen in those who use sufficient exercise to place a check on the too rapid increase of the vital fluid; the surface of the body, and especially the face, becomes of a florid aspect, and there is an increased discharge of fluids from the alimentary canal, kidneys, &c. &c.

Now, although these excited actions may go on for a considerable time, tending to counteract the injurious influences of repletion on the system, especially if the habits and occupations of the individual favour the sanative efforts of nature, yet sooner or later important organs flag in their functions, or the constitution generally yields beneath a power far superior to its weakened condition; and hence local inflammations, active hyperæmias, or general fever stampt their own peculiar symptoms on the primarily originating condition itself. It is at this stage that symptoms of cerebral hyperæmia are developed, and amaurosis succeeds as a consequence of the implication of the visual nervous system in the same morbid actions.*

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* The division here adopted is founded on practical grounds, and not on a mere desire to be minutely correct; for it will be obvious that a wide difference should be made in the treatment of active, passive, mechanical, and sympathetic congestions, and modifications are requisite in the subvarieties themselves: hence the advantage of considering the cause, and recognizing the difference between an active local hyperæmia dependent on a constitutional cause, viz. active, general plethora, and that originating solely in a local, without any necessary connection with a general, viz. hypertrophy of the left ventricle of the heart, and again separating the local effects of pressure from the retarded circulation induced by disease in the heart or great vessels; whilst local hyperæmiæ dependent on some manifest disturbance in distant and associated organs, would call for treatment having an especial reference to their derangement, besides the measures adopted for the local congestion itself.

It was from the consideration of the differences requisite in the treatment, and not from the mere differences of the causes themselves, which suggested the foregoing division to my mind; for it will be obvious that a confused account of many different affections, having something in common under one name, must tend to great confusion and perplexities in treatment; and those affections the pathology of which is not clearly understood, must require a very confused account of the mode of treatment, a great many exceptions and qualifications to some general rule, in order to adapt it to each particular variety; and although practical men may themselves recognize differences, and use appropriate modifications, yet they are theoretically unacquainted with their own motives, and quite incapable of explaining them to others.

Symptoms.—One of the first symptoms experienced on the commencement of such an attack is severe headach, with heat of head and throbbing of the carotids. The patient complains that the cephalalgia is increased with each pulsation, and decreased in the arterial diastole; gaining this pulsatory character, especially from excitement or motion. It is felt chiefly in the forehead and temples, and is invariably increased by a low position of the head, stimulants, warmth, active exertion, flatulence, or food. It is rarely constant, but occurs in irregular paroxysms, with periods of relief of uncertain duration. During its continuance the preternatural vascularity of the retina is denoted by the sensation of luminous or dark spectra, especially seen from any sudden motion, stooping, or viewing objects from an height; and nothing is more common than for a plethoric individual to experience the sensation of a shower of falling sparks, and to become temporarily amaurotic on stooping much, even before any other symptom of an untoward character have developed themselves. With these phenomena the countenance is found flushed, congested, and florid; the head hot, with noises in the ears, and beating of the carotids; the patient is drowsy, and indisposed for exertion; the mental faculties diminished, and the intellect incapable of much exercise; whilst the pulse is full, strong, and morbidly frequent.

The amaurotic symptoms are in general developed gradually; but this is not invariable, since, from some exciting cause, a sudden determination of blood to the head may be originated, attended with amaurosis, usually more or less complete. As regards local appearances, we find both eyes almost invariably affected, although one is usually more amaurotic than its fellow; the textures are sound, but more vascular than natural; and the conjunctiva and sclerotica present several large scarlet trunks ramifying on their surface. The eyes themselves may be slightly protruding, and the patient may complain of a sense of throbbing in them. Occasionally, during the commencement of the disease, the patient manifests impatience of light and contracted pupils; but invariably, as vision becomes more and more imperfect, this intolerance passes off, the pupils dilate, and their motions become more and more limited and sluggish.

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* Vide Author's Essay on the Influence of Constitution in the Production of Disease.

The very condition we have been describing has been frequently observed in females about the middle period of life, who have lived freely, taken little exercise, and whose habits of life are sedentary. Sir C. M. Clarke * has described the affection when in connection with a mucous discharge from the vagina. These females suddenly become corpulent and plethoric, become weak and debilitated (or apparently so), being able to take very little exercise without fatigue, and are readily overcome by any exertion; hence, the individual's habits, from being sedentary by choice, become so eventually from necessity, to avoid the inconveniences which would attend much exertion.

In many of these cases the liver undergoes chronic enlargement, attended by a corresponding protrusion of the right side, whilst its functions are diminished, and the fæces consequently voided of a clay or even white colour, with unnatural fœtor, the bowels being proportionately constipated. The mucous discharge from the vagina increases, and menorrhagia is developed. On inquiry it will be found that the woman has been attacked with fits of giddiness and sleepiness, pain in the head, and indistinct vision, such as a waving appearance when the eyes are open, or a sensation of sparks when closed; and, during these attacks, epistaxis producing relief is not uncommon.

Many years may elapse before any danger is apprehended, and then all at once she may be attacked with a fit of apoplexy or some severe internal hæmorrhage, which may quickly destroy her; or she may gradually become dropsical, and thus at length die. The symptoms are diminished by the catamenial flow, and the mucous discharge is probably in some degreee useful; hence, if a check be given to it without employing any means of unloading the blood-vessels, the violence of the symptoms are generally increased.

Causes.—In the healthy body, the daily introduction of new matters into the circulation is exactly balanced by the requisite expenditure in the performance of the various animal functions; but this is subject to disturbance from a variety of causes. Thus, in many instances plethora is plainly attributable to the quantity and quality of the diet consumed, the free use of malt liquors, or stimulating and exciting drinks, imperfect exercise of the body, lazy or indolent habits, sedentary occupations, &c. (by which the vigour of the circulation, and the usual loss by wear and tear, are diminished, and constipation induced), a natural tendency to a corpulent condition; and, lastly, the diminution or suppression of accustomed secretions or discharges, as epistaxis, the hæmorrhoidal flux, the catamenial discharge, or the secretion of large ulcers which have been accustomed to discharge freely for a considerable time. By one or many of these causes, the blood becomes increased abnormally in volume, and the relative proportion of its nutritive constituents. I will now endeavour to illustrate these statements by a few cases before I proceed with the treatment.

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* Diseases of Females, &c. Part 1st, p. 316.

Case—Gradually increasing amaurosis of both eyes, following a sudden and severe attack of headach, slight ulcer of cornea on one eye, non-appearance of the menses.—Elizabeth Belson, 15 years of age, was admitted as a patient of the West of England Eye Infirmary, on the 25th of August 1841. She is a tall and very stout girl of her age, and of a full and florid appearance.

She states that, about two years since, she was seized with a sudden and very severe attack of headach, which lasted six weeks, and continued, during the greater part of that period, so severe, that her mother expressively described her condition "as being unable to lift her head from the pillow." During this illness she was attended by a medical man, who bled her locally, under which treatment the severity of the pain passed off, but her sight failed gradually from that date, and has continued to get worse and worse, so that at present she possesses scarcely any useful vision.

At present she complains of great defect in her visual powers, so that she is unable to walk about alone; her sight being misty and obstructed. There is present a slight ulcer of the cornea; her head appears of an unusually large size, and she is of a full plethoric habit. Her appearance is dull and heavy, especially about the eyes; her countenance bloated, and, at the time these notes were taken, somewhat pallid. Both pupils are dilated, and both irides act very imperfectly and sluggishly by the alternation of light and shade. She has a full pulse; her bowels regular; she has never menstruated. She complains also of an occasional pain, which affects the whole head.

Since the commencement of the existing symptoms, she had been treated antiphlogistically without benefit. She was now (August 25th 1841) placed under the following treatment. A weak solution of the nitrate of silver was directed to be employed as an application for the ulcer of the cornea, five grains of *Pil. Hydrarg. Chlorid. comp.* to be taken every night, and to apply the *Ung. Antim. Potass. Tart.* to the back of the neck.

September 3d. Vision has decidedly improved since the last date. To continue the same treatment, with the addition of ten grains of the *Pil. Aloës* c. *Myrrhâ* every night. Had not reapplied in November.

Remarks.—At that period of life when the catamenia ought to occur, or at a time shortly afterwards, if they fail to be secreted, or having appeared, are again suppressed by causes which derange the general health, different constitutional diseases may be established, leading to different results; either the general powers may sink, the vascular system become comparatively empty, and impoverished in its contents, with those other derangements in the economy constituting chlorosis; or, on the contrary, the vascular system may become absolutely or relatively full, the one with an exuberance of power, the other with a comparative defect in this particular. Amaurosis may occur, and does occur comparatively often in either of these two last constitutional conditions. The relative plethora is, however, by far the most common. The case just detailed is obviously an illustration of the active form, although I am not perfectly satisfied that this condition was not preceded and primarily occasioned by actual inflammation of the membranes or brain;—such a condition remaining in a subdued form, complicated with the general cerebral hyperemia, and concerned in the causation of the loss of vision, although there is no clear evidence of the fact, and mild antiphlogistic measures speedily relieved its severity. The general symptoms clearly indicated a condition of active plethora, and although a tall and stout girl of her age, she had never menstruated; in fact, she had arrived at that period of life, when it is necessary for the individual's health, that this periodical secretion should be established. In the present instance the quantity of the blood became excessive, a natural tendency to this condition probably existing, and in the advanced stage of this constitutional condition, the local phenomena became developed. The progress I have narrated, and the effects of gentle treatment, continued for a short time, were encouraging. I have no doubt that the induction of the normal flow of the catamenia would have been of great service.

Hyperemial amaurosis from general plethora in its advanced stage, affecting the left eye.—Ellis Bolt was admitted a patient into hospital on the 17th of June 1841. He was 24 years of age, tall, robust, and of a full and plethoric constitution. On his admission, he complained of almost complete loss of vision in the left eye, but stated that the right organ was quite perfect in its functions. He had been gradually losing the vision of the left eye for the last twelve months, and during and before that period, had been suffering from severe pulsatory headach, especially affecting the right side, accompanied by excessive giddiness, greatly increased by stooping; and he stated that, if he continued this posture for a long time, his senses left him, and he could with difficulty recover his balance. Previous to his application he had been under treatment for some time, and had been bled from the arm, among other things,—a proceeding which afforded him relief, but of no long duration.

Symptoms.—At present, (June,) he suffers from the same sense of fulness in the vessels of the face and head, with severe headach, almost complete loss of vision in the left eye, with photopsia. The pupil of the left eye is much dilated, and moves very sluggishly by the alternation of light and shade. The vertigo continues very troublesome, especially on stooping; pulse full, strong, and frequent; tongue clean; appetite good; bowels regular. He was directed the tartar emetic ointment to be applied to the back of the neck sufficiently often to keep up an active eruption, and purgative doses of sulphate of magnesia with sulphuric acid, three times a-day.

July 6th. The pain in the head has been greatly relieved since the commencement of treatment, and the sight has much improved. The discharge from the back of the neck has been kept up with perseverance, and its local effects are now considerable. To continue the same treatment.

July 27th. All the symptoms of determination of blood to the head have disappeared, and his visual powers in the left eye are restored, or nearly so, to their normal strength. He was discharged perfectly cured in a day or two.

Remarks.—When local determinations occur in the advanced stages of active or absolute plethora, the local symptoms of the deranged functions of the part concerned in the morbid process differ not from those which are present in other forms of determination arising from accidental causes, but have superadded to them those also which arise out of the constitutional condition itself; hence, in these cases, in addition to the treatment instituted for the local determination, the constitutional derangement requires specific attention. In the case which I have just detailed, the beneficial influence of continued purgation, with efficient counter-irritation in the neighbourhood of the deranged organ, is well illustrated, especially when we reflect that the disease had been a full twelvemonth, if not more, in its progress, and was under treatment only about six weeks, when he was discharged perfectly cured. To the fulness and plethoric vigour of this patient's frame, the full, rapid, and strong pulse, were superadded the florid and bloated countenance; the deep-seated pulsatory headach; the extreme giddiness, and its great aggravation, by stooping, of local determination of blood to the head, and this, doubtles, deriving its origin from constitutional causes, and not from any accidental circumstances, as the slow but gradual and progressive advance of the amaurosis and other symptoms abundantly testified. It was here confined to one eye, which was a very unusual circumstance.

Severe head symptoms, with loss of sight, threatening apoplexy, may occur suddenly in the plethoric constitution. Mr B. Bell has narrated an interesting example of this kind, cured by judicious blood-letting. It occurred in a gentleman aged 36, in the enjoyment of robust health, but inclined to corpulency, who was engaged in reading aloud to his family, when his sight became so imperfect that he was unable to proceed, &c.*

I will now proceed to the general subject of treatment.

Treatment.—When the constitutional condition has proceeded to the development of local hyperæmia and amaurosis, the patient speedily seeks advice, and then our indications for treatment are, first to remove the constitutional cause, and secondly, to direct our attention to the local. General measures should be directed to deplete the vascular system, and to prevent the renewal of repletion, whilst local measures are pursued in adaptation to the condition of the visual nervous system; hence it will be necessary to consider in detail general blood-letting, purging, abstemious diet, and abundant exercise; also, local bleedings, cold applications, counter-irritation, and, perhaps, a slight constitutional action of mercury.

General Blood-letting.—In general the indications for abstraction of blood in plethoric amaurosis fall short of a full constitutional action, and we are content to abstract such quantities, and at such intervals, as shall be sufficient to remove the general hyperæmia, without inducing syncope. But, under certain circumstances, to which I shall presently allude, it may be necessary to give the remedy its full constitutional operation, drawing blood until symptoms of faintness commence. Should such be the case, the patient should be placed erect, and blood taken from a moderate sized orifice, and stopped on the decided approach of syncope. This gives us the opportunity of estimating the susceptibility of the patient to the loss of blood; it precludes the possibility of abstracting too much or too little, (if ordinary care be taken,) since the constitutional susceptibility is an excellent index of the proper quantity to be abstracted. It should never be performed in the horizontal position, nor from too small an aperture, since an excessive quantity might be thus removed, before leipothymia was induced; again, never from too large an aperture, because the sudden loss would occasion premature syncope; and lastly, according to Dr M. Hall, when the feet are cold. Blood-letting carried to incipient syncope is indicated in those cases, where the head symptoms are so severe as to point out a danger of apoplexy, and I may state that the following symptoms would clearly indicate such a tendency. Severe headach, throbbing, vertigo, noises in the ears, and blindness; violent pulsation of the carotids, and flushing of the countenance; slight attacks of insensibility or incoherence; partial paralysis of the face, epistaxis, and such an aggravation of these symptoms on stooping forwards, as indicated a condition not far removed from simple apoplexy, and which would readily pass into such condition on the application of some slight exciting causes. Under these conditions, the removal of a large quantity of blood is required to overcome the tolerance of the system to its loss,—a tolerance even superior to that induced by acute inflammation of the large serous sacs, or parenchymatous tissues.

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* Edinburgh Med. and Surg. Journal, Vol. lv. p. 457.

The repetition of venesection will be guided by the same indications here as in inflammatory affections; judging by the effects of the first trial, the recurrence of symptoms, and the general powers,—remembering that the system may all at once become extremely intolerant of further loss, when the local hyperæmia has been relieved, and then, if pushed farther, that exhaustion may rapidly supervene. Dr Abercrombie* tells us that he has repeatedly been consulted under such circumstances. A gentleman, who has been accustomed to very full living, is seized either with an apoplectic attack, or symptoms indicating the most urgent danger of such a state; he is saved by bleeding and other free evacuations, and is kept some time upon a very spare diet. His complaints are relieved, and as long as he keeps quietly at home, he goes on without any uneasy feeling. But when he begins to go about, he becomes liable to attacks of giddiness and confusion, accompanied generally by palpitation of the heart, and an uneasy feeling about the præcordia. His pulse is now soft and rather weak, and his general appearance the reverse of plethora, and these symptoms are relieved by a cautious improvement of his regimen. This curious fact I have repeatedly had occasion to attend to in the treatment of cases of this kind, and it has always appeared to me to be of very great interest in reference to the pathology of the brain.

As regards *local blood-letting*, we may use it as a powerful adjuvant to its general employment, calculated to insure its good effects, and act with especial influence locally, during the reduction of the general powers following venesection. But in that stage of plethora in which only moderate general abstraction of blood is requisite to treat the constitutional condition, the hyperæmia of the visual nervous system itself requires the judicious use of local abstraction by cupping or leeches. Whatever be the ***modus operandi*** of local depletion, it acts most powerfully in subduing local congestions, especially when used during that constitutional depression which a larger abstraction originates.

The quantity and frequency of repetition must in all cases depend on the individual peculiarities,—on the age, sex, constitutional powers, and idiosyncrasies of the patient, with due reference to the severity of the local symptoms; whilst in many the cupping apparatus may be made to fulfil every indication, and insure every advantage both of general and local depletion.

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* Researches on the Diseases of the Brain, &c. p. 308.

Purging.—It will be unnecessary for me here to enter at large on the subject of purging; the severity of the head symptoms mainly determining its activity, active purgation being necessary in those severe cases threatening apoplexy. It would be advisable to administer a full dose of calomel and jalap, or from x grs. to ℈i. of calomel, followed in a few hours by croton oil or castor oil, and aided by suitable injections, the after symptoms pointing out the propriety or impropriety of its repetition. In ordinary cases of plethoric amaurosis, however, the secretions may be stimulated by mercurials and antimonials, and the bowels kept lax by aloes and colocynth, saline aperients being occasionally alternated.

The advantages of purging are derived from the influence they secondarily exert on the system by their primary effects on the abdominal nervous system, by clearing out offending matters, their action in hurrying off the chyle and undigested aliment, and thus preventing the excessive introduction of new matters into the circulation, by increasing the intestinal secretions, and thus draining the vascular system of its abnormal contents, and by the special sympathy which the intestinal canal possesses with the head, both as regards function and circulation.

Excessive purging may induce many evils. It may cause inflammation or ulceration of the intestinal mucous membrane, or even give rise to exhaustion and its consequences, as from loss of blood, whilst the moderate action of laxatives is far from being incompatible with healthy digestion and absorption.

In abstemious diet, we possess the means of regulating the quantity of nutritious substance which by digestion shall pass into the circulation, and hence can adapt this to existing circumstances. In the severe cases, the diet should consist of mere liquids, and these in small quantity. In the treatment of plethora, the quantity should be small, and of this, animal food should form but an inconsiderable share. The peculiarities of the case will suggest the other rules to be attended to in the regimen.

Exercise affords the means of keeping up a healthy vigour of the circulation, increasing the secretions, and augmenting the daily necessity of repair. It requires regulation; to be commenced with moderation, but resolution, and increased with the increased power of bearing it without fatigue. The mode of exercise should employ the muscular system generally: hence gardening, rowing, walking, riding, &c. are all of them applicable in turn.

Cold Applications.—The systematic use of these is required only in cases verging on apoplexy. Under ordinary circumstances, the head should be kept cool, the hair worn short, and the feet retained warm by the occasional employment of hot and stimulating pediluvia, and warm clothing. The extent and exact form of counter-irritation must be determined by the peculiarities of the case, and the activity of the head symptoms. When these are severe, or the patient comatose, after the free employment of blood-letting, a large blister may be applied to the back of the head, or the head may be shaved and the scalp covered by a blister. But where the primary and main object of treatment is the local and general hyperæmia simply, it is necessary to maintain a more permanent form ; and this is best effected by a seton in the nucha, or the use of the potassio-tartrate of antimony ointment to the same situation, the permanent drain tending to keep the plethoric tendency in check. The occasional use of blisters behind the ears, allowed to heal, and their subsequent application is serviceable.

Mercury.—When the predisposing, exciting, and continuing causes of this form of amaurosis have been removed by the judicious employment of the measures already alluded to, but still imperfection or loss of vision remains, we possess a powerful and most valuable remedy in mercury. The remedy should be used in mild doses, so as gently to affect the constitution, keeping up this condition for the requisite length of time. The action, doses, and choice of preparations are similar to what I have already mentioned under the head of chronic retinitis, and to which I must refer.*

In conclusion, I would remark, that many other measures might be indicated in particular cases, and that success frequently depends on the searching out and removing some complicating derangements, and attention to all measures, however insignificant, which can improve the general health.

HYPERÆMIAL AMAUROSIS FROM DETERMINATION OF BLOOD.

a. From accidental Causes. — I will now consider the remaining forms of hyperæmial amaurosis, a tabular form of which I have already given, and first that of local determination from accidental causes. As regards the word determination, it may be considered to convey the idea of an increased flow of blood to a part, with a quickened circulation through the affected vessels, and the presence of those symptoms which are usually supposed to denote "increased arterial action," such as violent pulsation in the arteries themselves, redness and heat of the organ, and disturbed functions, in contradistinction to passive hyperæmia, where the vessels are abnormally full, but the circulation through them diminished. But it may be asked, and it has been frequently asked, how active determination of blood can take place to certain organs, attended by an increase both in the volume and force of their arterial pulse, while the arteries themselves possess no muscular or other contraction capable of explaining these local attacks; and the heart which injects the blood into the arterial system acts with equal force in every direction. To this we must remark, that nothing like arterial action exists, inasmuch as the action of arteries must be the contraction of tone, elasticity, &c. occasioning a diminution of the calibre, whilst the vessels of a part suffering from active hyperæmia are obviously dilated, and the altered vital relation of their parietes to their contents modifies the character of their pulse by modifying the propagation of vibrations along their parietes, and from failing to meet with due resistance, the force caused by the propulsion of the wave of blood; hence the local alteration in the nervous condition of the vessels concerned modifies their elastic and contractile powers, they become enlarged, and by so doing tend to obstruct the current of the circulation through them, and thus react on the heart, which institutes new energies to overcome the local disturbance. If this explanation be correct, there is rather deficient than increased arterial action, and we must attribute the first step in the series of pathological phenomena to the local nervous disturbance of the coats of the vessels themselves, and to the disturbance of that mutual vital relation which subsists between the blood and solids.

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* Vide Lancet, Vol. ii. 1840–41, p. 42.

Amaurosis dependent on an accidental determination of blood to the head may be sudden * and complete in its attack, or gradual and less severe. The amaurosis may be the most prominent symptom, or head symptoms may exist to so considerable an extent, as to threaten a danger of apoplexy. The local symptoms of amaurosis from an accidental determination are similar in every respect to those we have already mentioned as occurring in plethoric individuals, although it occasionally assumes an intermittent character, of which I have a very remarkable case on record.

Causes.—The most common predisposing and exciting causes of these attacks are errors in diet, or the action of injurious ingesta, sudden or chronic derangements of the digestive, excreting, or uterine functions, intoxication, intense or prolonged study, or mental inquietude; whilst it may be favoured by a low position of the head during sleep, or keeping the head too hot, &c. To this list, I may add the sudden healing of ulcers accustomed to discharge freely. When the influence of any disturbance in associated organs, producing these symptoms, is obvious, the case should be referred to sympathetic hyperæmia, and such derangement made an especial object of treatment. In some cases, the exciting cause is not apparent, or, having existed and passed away, its has left no trace of its previous presence, save the actions which it secondarily induced; thus furious bursts of passion may leave their own punishment behind them, although the mind itself has ceased to dwell on its own discomfiture.

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* Mr B. Bell (loc. cit.) narrates a good illustration of this fact. A hale-looking man of 60, tall, and by no means inclined to corpulency, went to his work, as a bookbinder, at five o'clock in the morning in perfect health. Shortly afterwards, he was seized suddenly with a swimming in his head and dimness of vision, succeeded by shooting pains in the head. There was no confusion of thought or paralysis, continuing in the same state on the afternoon of the following day. He complained of headach, impaired vision, being quite unable to read, and a tendency to sickness on sitting up, with a peculiar expression of his eyes. The pulse was strong, full, and incompressible; tongue clean and moist.

Two pounds of blood were taken from his arm in the sitting posture, without the supervention of syncope; and as it flowed, the head became easier, and the vision improved. Several active doses of purgative medicine completed the cure, so that two days after the bleeding, he complained only of weakness. P. 466.

Mr Lawrence * narrates a case where complete amaurosis, with sudden sensorial hyperæmia, was apparently produced by salivation. The patient was about thirty years of age, and was admitted for enlargement of the testicle, for which some mercurial liniment was directed. After employing this four or five times, salivation occurred. He felt indisposed in the evening of Saturday, but went to bed without making any complaint. In the middle of the night he awoke with great pain in the head, and feeling very ill, he got up, and imagined that the light usually kept during the night was gone out, for he could not see it; in fact, his sight, which had been perfect when he went to bed, was lost. The house-surgeon found him with a full, strong, and frequent pulse, and bled him. He afterwards administered an emetic, which was acting when Mr Lawrence saw him at twelve o'clock on Sunday. The pulse was still full and strong, and there was great pain in the head. The pupils were about the middle state; the irides nearly, but not quite motionless, and vision so completely extinct, that when a lighted candle was held near the eyes, the patient was not sensible of its presence. Mr Lawrence directed the repetition of bleeding, and the application of a large blister at the nape. These means were repeated. In a week, vision was restored; and in a fortnight, the patient left the hospital quite well.

Although, in assuming this attack to be dependent on the salivation as its exciting cause, without examination into other circumstances, would be rather "post hoc ergo propter hoc" sort of reasoning, yet this appears to me much more probable than any influence to which the term metastasis could be applied; in fact, I confess myself a disbeliever in such doctrines, having been always able to trace the operation of more definite and certain causes, in such cases as have fallen under my own observation.

Case of hyperæmial amaurosis from determination of blood

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* Treatise on Diseases of the Eye. 2d edit. p. 512.

to the head, apparently dependent upon the rapid healing of ulcers and abscesses accustomed to discharge freely in a strumous constitution.—Peter Ekers was admitted into the West of England Eye Infirmary on the 21st of June 1841, complaining of great imperfection of vision in both eyes. He was ten years of age, and of a decidedly strumous constitution, having suffered from scrofulous enlargement, induration, inflammation, and then suppuration of the cervical absorbent glands, especially during the last five years; and he stated that he had resided in a country situation during his lifetime. His neck had latterly been very bad, and had given rise to extensive abscesses and ulcerations, which had discharged constantly and profusely, until within the last six months, when they began to heal, and healed very rapidly, the last abscess having healed about three weeks before his application, since which time he has lost his sight, at present (June 1841), not being able to distinguish even large print, and complaining of great dimness or vision.

No other causes could be adduced than the rapid disappearance of the discharge to account for the equally sudden supervention of his symptoms.

Symptoms.—His countenance appears full and congested, especially the temples; pupils dilated and nearly motionless; organs of vision preternaturally vascular. He complains of slight pain over the brows, and a sense of fulness and distension in the orbits, with a general sense of oppression, weight, and pain in the head. His tongue was healthy; pulse rather quick and full, but regular; his bowels confined. In other respects healthy.

He was ordered two or three doses of calomel, after which a purgative, blisters behind the ears, and to the back of the neck, hot and stimulating pediluvia nightly. June 25th. The pain and fulness he had complained of were much relieved, and he appears in all respects better. July 2d. Continues better; the blister to be kept discharging. *Pergat.* July 26th. His sight and all his other symptoms continue to improve daily; the blister has healed. To take a compound aloëtic pill every night. July 23d. His general appearance is now greatly improved; his pupils are much less dilated; has lost all pain in the head, and sense of weight and fulness over the brows; and he states that he can see tolerably well. He was discharged cured on the 6th of August.

Remarks.—The rationale of this appears clear. Ulcers and abscesses accustomed to discharge freely are somewhat suddenly healed, and local determination of blood results, followed by the usual symptoms of hyperæmial amaurosis from this cause. Similar cases to the present are on record. Beer narrates an illustration of the same fact, where the amaurosis succeeded the rapid healing of ulcers of the legs. He cured it by reproducing the ulcers by the action of sinapisms the size of the hand applied daily, with stimulating pediluvia. It is thus narrated. *Amaurosis from the suppression of a purulent discharge.* *—A waggoner, aged 45 years, undertook a journey in wet and cold weather. The discharge from ulcers of his legs, which had for many years continued open, was suppressed, and he became blind. Fourteen days after he was brought to the hospital, he saw nothing, not even a brightly lighted window. The pupil was oblong, and extremely dilated. Beer immediately pronounced the most favourable prognosis, especially as there were present internal sensations of light in the eye, without varicosity; and without change in the humours. He had cured more than twenty such amaurotic patients, by restoring the purulent discharge The material part of the treatment consisted of the following measures;—sinapisms of the size of the hand to the ulcers of both legs, and pediluvia with mustard. The sinapisms were renewed daily, and on the tenth day vision began to return. The sinapisms acted severely on the ulcers, which became deep cavities, with dark-coloured edges. In thirteen days vision was almost completely restored.

When a drain to which the system has become habituated is suddenly stopped, two effects may result; either a general repletion of the vascular system, leading in time to some injurious consequences, or else determination of blood to some organ, similar in nature to that vascular derangement which, when it relieves itself, induces a vicarious hemorrhage, as from suppressed menstruation. The last is the most common form or mode of action, and the one effected in my present case. The mere difference of cause need not influence the treatment, where the pathology is similar, but bleeding, local and general, if indicated by the general powers—purging, counter-irritution, and hot and stimulating pediluvia are sufficient, indeed, few patients would be willing to try the effect of mustard cataplasms to the site of previous ulcers, and their daily repetition, and our rule should be to cure in the mode most consistent with reason; not only quickly, but with as much freedom from unnecessary suffering to our patient as possible.

Several cases of this form of amaurosis are on record, induced by various exciting causes; thus, occurring during pregnancy by Sennertus,† occurring during pregnancy, and cured by the flow of the lochia by Salmuth,‡ &c.§ suppression of epistaxis, (Trnka, p. 192.) We find several interesting instances, collected by the same author, from suppression of the menses, cured by antiphlogistic treatment, (p. 421–425), various suppressed discharges and secretions, (p. 185, et seq.), and cutaneous and other affections, (p. 196). Mauriceau, (Obs. cent. 5, Obs. 568), has narrated the case of a robust and plethoric female, who had suffered from convulsions a month before parturition, and who, after a prosperous parturition, the lochia flowing more scantily than was fit, entirely lost her sight within twelve hours, and was tormented by excruciating headach. She completely regained her sight by bleeding from the foot in another day.

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* Quarterly Journal of Foreign Med. and Surg. Vol. i. p. 448.

† Pract. Med. Lib. i. p. 3. ‡ Obs. Med. Cent. 3, Obs. 27.

§ For a history of these and other cases, vide Trnka Historia Amauroseos, pt. i. p. 91.

Local determination of blood to the head from hypertrophy of the left ventricle of the heart.—This is a subject which has been much insisted on by Dr Hope in his Treatise on the Heart, and by other observers in the same field of practice. Dr Hope is led from his own observations to believe with M. Richerand and MM. Bertin and Bouillaud, that simple hypertrophy and hypertrophy with dilatation, form a stronger predisposition to apoplexy than the apoplectic constitution itself; and that in most instances those persons who present the apoplectic constitution, with symptoms of determination of blood to the head, are at the same time affected with hypertrophy. When affections of the head exist, the patient complains of a "rushing of blood to the head,"* especially on making any corporeal efforts or on stooping; of more or less intense, throbbing and lancinating headachs, aggravated by the recumbent position, and especially by the act either of suddenly lying down or rising up; of vertigo, *tinnitus aurium*, scintillations, and other visual illusions; sometimes oppressive drowsiness, which so completely subdues the faculties both of mind and body, as to incapacitate him entirely for every species of exertion. These symptoms may proceed to the establishment of complete amaurosis, with or without a termination in palsy, apoplexy, or inflammation of the brain. The opportune occurrence of epistaxis, to which the patient becomes liable, may retard or prevent these untoward results. The conjunctiva and sclerotica, as well as the face generally, bear evidence to the hyperæmia of the superficial vessels; and Dr Hope has remarked that whilst the circulation is active, during the early stages of hypertrophy, the eye is bright and sparkling, and sometimes vascular or bloodshot. The objects of treatment are, to remove the predisposing and exciting causes, to tranquillize the circulation, and to reduce the volume and quantity of the blood, even somewhat below the healthy standard. I must, however, refer to Dr Hope's treatise for a full explanation of this subject.†

SECOND DIVISION.—*Passive Hyperemial Amaurosis.*

a. From relative Plethora. — The constitutional conditions of relative plethora and excrementitious redundancy, are fruitful sources of amaurosis from passive hyperæmia of the general visual nervous system. In the first form, "plethora ad vires," there is repletion of the vascular system and inadequate power of resistance in the patient's system: hence the circulation throughout the body generally is deficient and languid; the pulse is soft, feeble, and compressible; and the blood, when abstracted, is dark, and its coagulum large and loose. The deviations from a healthy condition are very slow and gradual, and the patient rarely displays any prominent symptom till an advanced period. There may be occasional languor and listlessness: irregular distributions of blood, marked by cold feet, and variable countenance; irregularity of the functions of the alimentary canal; of the catamenia in females, with more or less disposition to hypochondriasis; capricious appetite; loss of tone in the solids, and decline of strength. Various organs are very apt to become the seat of passive hyperæmia during the progress of this condition; and at a later period some constitutional efforts are usually excited, although much slower and less certain in their approach than what we have previously mentioned as occurring in absolute plethora.*

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* Vide Hope's Treatise, 3d edition, enlarged, pp. 255 to 262.

† Vide loc. cit. p. 281.

The qualities of the blood itself may be vitiated in a very remarkable degree, and this morbid condition of its vital† and chemical qualities is most usually combined with relative plethora. Dr Barlow has named it excrementitious redundancy. It results from the accumulation of noxious principles in the blood by their defective removal in the excretions. This condition is characterized by great sallowness of aspect and duskiness of skin; the pulse is slow and compressible; the surface of the body becomes harsh, dry, and very subject to scaly and other cutaneous diseases, being deficient in its natural transpiration; the tongue is usually moist, flabby, marked with the teeth, and covered with a slimy coating; the appetite capricious, often voracious; the alvine evacuations inveterately foul, usually with a disgusting and unnatural odour, clay-coloured, and exhibiting no trace of healthy secretion; the urine is high-coloured, depositing a dark sediment, and often very fœtid; even the perspiration is offensive, and gives a dusky tinge to the linen which absorbs it.

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* Vide author's essay on Constitutional Influence. An excellent article on Plethora will be found in the third volume of the Cyclopædia of Practical Medicine, by Dr Barlow, p. 364, &c.

† In considering the pathology of the blood, it appears to me as requisite to recognize vital changes in its constitution, by which the physiological relations between it and the solids are disturbed, not recognizable by chemical analysis, as it does to recognize functional derangements of the solids, not recognizable after death by the knife of the anatomist, or even by the microscope; hence we are not to deny the existence of many and important changes in the blood's condition, merely because they cannot be detected by chemical reagents; for, leaving out of the question the imperfections of the science itself, I as firmly believe that its vital constitution may be materially affected, and yet no chemical changes have been induced in its constitution, as I do that mere functional lesions occur in the various organs indetectible to the skill of the pathological anatomist, and which originate no lesion of structure whatever; for who will pretend to deny that the nervous system remains intact in some of its affections and derangements, and where the minutest scrutiny of the artificially aided senses fails to appreciate its lesions?

The local symptoms of cerebral congestion which come on in these cases are very different from those of active determination. They are those of congestion, with feeble and diminished circulation. The headach is dull and oppressive; a sense of weight without much pain; the countenance is expressive of the oppression and dulness complained of, being more or less livid, and sometimes pallid; there is usually stupor, heaviness, noises in the ears, giddiness, and sleepiness; the sleep is in general heavy, sound, and snoring, sometimes restless and disturbed by dreams; the pulse in the carotids weak, full, and readily compressive, generally slow, but sometimes accelerated; there is lowness of spirits, and the patient is nervous and hypochondriacal. All the symptoms, but especially the giddiness, are increased by stooping, or by looking upwards or downwards from a height. The amaurotic symptoms occur in both eyes, although in general the disease in one takes the lead of the other, the symptoms being developed gradually. The patient first complains of a dark mist, which obstructs vision, attended by *muscæ volitantes;* this, in some cases, proceeding to complete loss of vision. The order and succession of both general and local symptoms, the diagnostic points, and the effects of treatment, are well illustrated by the following case, which I believe to have been of this nature.

CASE.*—*Complete Amaurosis of both Eyes; suppression of the Catamenia, with continued, dull, oppressive headach.*—Harriet Cooper, aged 20, was admitted under the care of Mr Lawrence, in May 1841, for complete amaurosis of both eyes. She is moderately tall, rather stout; her complexion bloated and livid, and her previous health, according to her own account, good, with the exception of occasional and severe sick headachs. She has spent her life in the country, and her occupations have been such as usually fall to the lot of an inmate in a farm-house.

About six months previously, she became affected with severe headach, which was almost always present, but appeared and disappeared at irregular intervals. The headach was not constant in its seat, but she suffered chiefly in the back of the head, and over her brows, the pain frequently ceasing towards night, when she slept well. Of late, however, many of her nights have been restless, and the pain severe. She describes the pain as dull, heavy, and oppressive, as having continued with uncertain intervals of relief for the last six months, and increased in severity rather than diminished, up to the time of her admission. Her sight failed gradually in the right eye about two months since, (from the beginning of June 1841), whilst the left eye became likewise affected shortly after,—vision failing without any particular amaurotic symptoms." When questioned about the commencement of her headach, she dates the symptoms to exposure to cold. Her appearance is highly vacant and amaurotic ; the axis of the eyeballs correspond ; the pupils of both are widely dilated, and possess scarcely any power of dilatation or contraction on the alternation of light and shade. The component textures of the globes appear healthy, but the conjunctivæ present a few large, dilated, livid trunks, running in the *conjunctiva oculi*, coming especially from the inner canthus, and converging to the cornea.

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* Vide Author's Paper, Med. Gazette, Vol. i. 1841-42, p. 216.

Her sight in either eye is lost entirely ; she is quite unable to discriminate the difference in the quantity of light falling on her eyes, when the hand is placed immediately in front of them, between her and the window, and when removed ; indeed, when questioned, she guessed the very reverse to fact. She states that occasionally she imagines that she does perceive light, and has sometimes the sensation of the appearance of sparks before her eyes. The headach is of the same character as she experienced previous to her admission, but is now occasionally so severe at night as to prevent sleep ; and the sensation of giddiness is severe when she stands upright. All the other cerebral functions are performed normally ; there is no lesion of sensation or volition, and she acknowledges to no imperfection of any other sense, but vision, (although the house-surgeon assures me that her hearing is slightly impaired) ; and the memory and intelligence remain, although the patient's comprehension is rather dull. Her countenance is congested and livid, and the surface of the body generally is dark and cold, from an evident want of vigour in the capillary circulation ; the pulse is soft and feeble, whilst the carotid artery pulsates with greater power proportionally than the radial. Her digestive functions were greatly deranged at the commencement of her illness ; at present the tongue is pale, moist, enlarged, and marked by the teeth ; the appetite good ; but the bowels irregular, and frequently constipated. The catamenia became deficient gradually, and ceased altogether about five months since, (from June.)

Diagnosis.—This case appears to me to be a severe form of passive hyperæmial amaurosis, dependent on a general faulty condition of the system, which constitutional state approximated most nearly to an advanced stage of relative plethora, to which, and not to any primary derangement of the uterus itself, I attributed the amenorrhœa and the alimentary disturbances. Mr Lawrence took a different view of the case. He regarded it as an example of amaurosis from cerebral disease, and considered the restoration of the catamenia as of great importance.

Had this case been under my own care, I should have acted, I must confess, on my own opinion of its pathology, which would have led me to the employment of mercury, so as to induce a very slight constitutional action, a series of blisters in succession, applied, allowed to heal, and then reapplied; stimulating pediluvia, with the use of purgatives and tonics, waiting till any tendency to reaction arose in the system, and then a sparing venesection. Mr Lawrence directed for her the aloes and myrrh pill, ten grains every night; mercury with chalk, two grains three times a day; six leeches to the ankles.

The patient remained in the same condition on the 10th of June. To repeat four leeches to the ankles.

11th. On questioning her to-day, she states that her general health is certainly improved since she came into the hospital, although her vision remains the same; the cephalalgia diminished; the objective and subjective symptoms of the eyes similar to the day on which the case was taken; several conjunctival vessels pass to the cornea from the inner canthus. To continue the medicines; four leeches to the ankles.

Six leeches were reapplied to the ankles on the 13th.

On the 15th there was less headach; the face still congested, and of a leaden colour; conjunctiva less vascular; vision as imperfect as on entry; pupils dilated and nearly motionless. To continue.

June 19th. Four leeches.

22d. Countenance flushed, but much less dusky; headach less; vision not improved.

At a period shortly after the last date, the catamenia returned fully, but vision remained unchanged. In this condition she left the hospital early in July. I have since heard that her headach was returning.

Remarks.—The case which I have just detailed is an example of a form of amaurosis by no means very uncommon in young females shortly after puberty, in whom this condition of circulation has begun and advanced from that date. It differs greatly from chlorosis, in which anæmia is a prominent feature, and by which it is readily distinguished. The headach, in the foregoing case, although it resembled that from cerebral disease, in its being nearly always present, yet in its other characters it exactly resembled what I have described as peculiar to passive cerebral hyperæmia; and the constitutional symptoms fully warranted such an opinion. The effects of treatment were very encouraging, and I have little doubt that something at least might have been gained as regards vision, if persevering local treatment had been adopted. That the langour of the circulation, and especially that of the cerebral, was greatly diminished during the patient's stay in the hospital was obvious, since the headach was sensibly diminished in continuance and severity, and the bloated and livid appearance of the complexion disappeared; the conjunctiva became less vascular, and the functions of the uterus fully and freely returned; hence, in my opinion, the prognosis, in regard to restoration of vision, would have been very favourable if active local measures had been instituted, although vision had not improved by the benefit wrought in the general symptoms, and in those of local congestion. And I may here remark, that a gentle constitutional action of mercury not only improves the secretions of the liver and alimentary canal, as well as the secretions generally, but exerts a very beneficial influence on local congestions, be they active or passive in their character, especially when such other local and general treatment be instituted as shall favour its operation, and remove any obstacle to its local effects. It is well to bear in mind the differences between passive congestions and actual cerebral disease;* indeed, no inconsiderable resemblance obtains between some of the more passive cases, and the slow but certain progress of chronic cerebral organic disease. Our diagnosis must be formed in the latter case by the presence of derangement or loss of the true cerebral functions, paralytic affections, lesions or loss of the senses, convulsive attacks, sickness, &c., whilst, in the former, the complexion, the headach, and the absence of many cerebral symptoms, with the good effects of judicious treatment, contrast greatly with such cases. Again, in the former, the character of the headach and amaurosis are such as would arise from passive congestion, in which the features are bloated and livid; the conjunctivæ traversed by tortuous dilated trunks, and the cephalalgia is dull, heavy, and oppressive, whilst, in the case of cerebral disease, the headach is severe and darting, with great sympathetic irritability of the stomach, beside the characteristic phenomena I have already mentioned.

Under the division of active plethora I made some general observations on the non-appearance or early suppression of the catamenial discharge, stating that occasionally active, but more generally passive, plethora resulted, and under that head I narrated a case of the active form. I will now give an illustration of the relative.

Case.—*Complete amaurosis of the right eye, imperfection of vision in the left, dull oppressive headach, non-appearance of the menses.*—Mary Hallet, 16 years of age, was admitted into the West of England Eye Infirmary on the 21st of May 1841. She stated that, for a series of years she had always enjoyed uninterrupted good health, and that her habitual employments were simply confined to domestic affairs. Her sight had been failing for the last six months, especially in the right eye, in which organ she had been completely blind for the three preceding months before her admission, whilst the left has been gradually getting worse since that period. During the whole time of the existence of these symptoms she has been subject to very severe, deep-seated, but dull and oppressive headach, especially affecting the right side. She states, moreover, that when about six years old, she became blind in both eyes, and continued in this condition for twelve months, at the expiration of which period, she was perfectly cured by blood-letting employed locally, and that she has remained well ever since, until the commencement of her present attack.

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* Vide a practical explanation of this subject by author. Med. Gazette, p. 215, &c. Vol. i. 1841—2.

Symptoms.—As regards her present symptoms, her countenance appears flushed, bloated, and full-looking; conjunctiva rather more vascular than natural, both pupils widely dilated and very sluggish in their movements, being both but little sensible to the influence of light; the globes generally and their component textures appear healthy. She complains of complete loss of vision in the right eye, being quite unable to distinguish light from darkness, or day from night with that organ, and of great imperfection of sight, with cloudy, misty, and deranged appearance of objects viewed with the left. At present her headach is very severe; she describes it as deep-seated, oppressive, but very severe, and as affecting the right side especially. She has never been affected with intolerance of light. Her tongue appears natural; her pulse is quick and weak, but full; her bowels regular; but she had never menstruated.

Treatment.—Her hair was directed to be cut off and kept cut close, and her head to be bathed with cold water; to take the compound aloetic pill night and morning, (*aloes c. myrrha*). She continued this treatment carefully for three weeks without any benefit.

May 11th, Was ordered to continue the pills and bathing; five grains of the *Pil. Hyd. Chlorid. comp.* to be taken in addition every night.

July 2d, Had continued the Plummer's pill for a long time (since last date) without any beneficial results, and hence was ordered to discontinue them and employ the aloetic alone.

July 5th, Her vision remains without improvement; general powers declining. Taking these facts into consideration with her own desire to depart, it was thought the best plan to allow her to return to the country.

Remarks.—But few remarks need be appended to the present case. It illustrates well the observations I have already made on a former case, both as regards constitutional and local symptoms. A condition of cerebral circulation, producing amaurosis, had once before existed, and received its cure in the abstraction of blood; but it would appear to have been more active in its character than the present attack. Can such local hyperæmias as the present merge insensibly into inflammation producing organic changes? and did the severe localization of the pain on the right side indicate that such had already commenced and made some progress in the instance before us? That such may occasionally result I have not the slightest doubt, although not the frequent sequents of simple hyperæmias; and as regards the present case, the fixed and continued character of the pain affecting the right side, the insufficiency of treatment, and the complete loss of vision in the right eye, would lead me, at all events, to suspect something of this kind. Again, however, I would refer to treatment, and assert the great powers of counter-irritation perseveringly and judiciously employed, and which I consider a great omission in the foregoing case. I prefer blisters applied behind the ears, then allowed to heal, and then reapplied, timely, general, or local blood-letting, according to circumstances, and a more full and continued constitutional action of mercury than was practised in the present instance, although it does not require a full, sudden, and powerful salivation, but a mild, persevering, constitutional use of the remedy.

2d. Passive hyperæmial amaurosis from venous congestion.—Passive hyperæmial amaurosis from venous congestion bears the same relation to that form of amaurosis occurring in relative plethora, as amaurosis from accidental determination of blood to the head has been shown to bear to the derangement of vision from active plethora; it is produced, in fact, from accidental circumstances, without any necessary reference to a constitutional cause. As regards the appropriate application of the term venous to these passive congestions, I would remark, that such appears justifiable from the colour of the congested parts themselves; thus we find the conjunctivæ, and complexion generally, dusky, bloated, or even livid, the vessels of the former evidently conveying dark blood. By such considerations we may infer that the venous capillaries and small veins are the parts chiefly deranged, since, in these cases, the disorder of the vascular system is only local, and cannot be referred to a general imperfection in the purification of the circulating fluid, as in passive congestions from relative plethora; but it is true, that, as the current of blood moves in the affected vessels with a diminished velocity, it may undergo the change to venous before it has reached venous canals.

The causes of these attacks are the same as those previously mentioned in connection with local determinations, but modified by circumstances; they either occur in individuals possessed of feeble vital powers, or where the tone of the vessels of the head has been injured by protracted and severe distension from previous hyperæmias, chronic disease, or severe injury. The local symptoms are similar in every respect to those which, in the previous division, I detailed as peculiar to passive congestions. After considering the next subdivision, I will speak of the treatment which should be adopted. I may, perhaps, illustrate my meaning more clearly by an actual example from nature.

Case of imperfection of vision in both eyes, pain over the brows, with some intolerance of light.—Christopher Lake was admitted as a patient of the West of England Eye Infirmary, on the 22d of June 1841, complaining of great imperfection of vision in both eyes, He stated himself to be 24 years of age, and to be residing at Dawlish. He is a stout healthy looking man, and stated his usual employments to be connected with shoe-making. The account he gives of the affection is the following: That early in the morning he can see pretty well, but becomes unable to keep his eyes open towards the middle of the day: that he is compelled, as he terms it, "to sleep away at his work;" at all periods, he is unable to work by a strong light, the effects of which occasion him considerable pain in the organ, but he can work best by a dim candle light. He complains of dull heavy pain over the brows, much increased by exertion or straining of his sight at work, and increased in connection with pain in the eyeballs themselves, by exposure to a strong light. His appearance was dull, congested, and inexpressive, with a peculiar heavy sleepy look about his eyes. Both pupils are much dilated and motionless; tongue clean; bowels usually regular, and digestion undisturbed; pulse full, and compressible. His vision was found to be very indistinct.

Treatment.—June 22d. He was directed to apply the *Ung. Antim. Potass. Tart.* to the back of the neck with regularity, until it produced a pretty abundant eruption, and then to use it occasionally so as to keep this up; to take five grains of the *Pil. Hydrarg.* every other night, and five grains of the compound colocynth pill, with one-twelfth of a grain of the *Ant. Pot. Tart.* every night.

July 2d. Rather improved in vision and other symptoms. To continue as before.

Still improving on the 9th, having lost the dull pain over the brows. *Pergat.*

September 3d. Vision still less defective than at previous date, but he now complains of severe pain in the head, especially over the brows. His appearance was dull, and his countenance flushed. To lose blood from the arm ad ℥xii. To continue other remedies with regularity. He had not reapplied in October 1841.

Remarks.—We may, I think, fairly presume that this was an example of amaurosis dependent on passive hyperæmia of the visual nervous apparatus generally, the cause of its production not being apparent. I come to this conclusion from the dull congested aspect of the countenance, the heavy sleepy appearance of the eyes, and the sense of weight and oppression over the brows, as well as the indolent condition of the mental faculties, and the tendency to sleep. Intolerance of light formed a prominent symptom in this case, and such I have found to be occasionally present in other forms, whilst the retina retains some powers of sensation, passing off with the increase of the amaurosis; but I am unable to account exactly for the circumstances which determine either its presence or absence. As regards the cause (exciting) which occasioned the hyperæmia, the position and occupations of the patient during his working hours may have greatly assisted, if it did not produce, the proximate cause of the complaint, aided by a tolerably free use of exciting drinks and irregular habits, which such individuals rarely consider unusual or faulty. By the operation of remedial measures, his vision was much improved, and his headach cured; but we find him on the 3d of September presenting himself with the general and local symptoms of pretty active determination of blood to the head, for which general blood-letting was employed. I presume he was cured by these measures, or so much bettered as to think it not worth his while to present himself again.

b. The consequence of previous Inflammations and Injuries, &c.—Mr Travers long ago remarked that a loss of balance in the sanguiferous system, occasioning an undue determination of blood to the head, often exists distinct from general plethora, and is aggravated by loss of blood.* Cases of undue determination of blood to the organ are especially common after deep-seated chronic inflammation, or distress from over-excitement, by which vessels have lost their tone, an effect decidedly increased by depletion.†

Mr Travers details an example of that form of amaurosis now under consideration.

A gentleman, aged 25, of short stature, and constitutionally healthy, came from the country one morning in extreme anxiety, earnestly requesting Mr Travers to apply a ligature to his carotid artery. His pupils were large, and his countenance suffused, and bore the appearance of preternatural determination of blood to the head. He had been the subject of two attacks of inflammation, one in April, the other in October of the same year, during which he had lost upwards of 100 ounces of blood. He had now a constant heavy pain in the head, chiefly over the coronal suture, and in the direction of the sinuses, with tinnitus of the left ear. After stooping, the giddiness was extreme, and a golden-coloured spot, edged with black, appeared floating before the eye. He had been troubled with muscæ in excess for a year and a-half past; he had now fire-sparks flashing before the sight, and saw a pulse in the choroid synchronous with that of the wrist. He was not troubled by muscæ when he regarded near objects, but they became numerous in proportion as the object was remote. Dimness of vision was not much complained of. He recovered gradually but perfectly under a regulated diet, and a course of the blue pill with saline aperients.

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* Synopsis of the Diseases of the Eye, 2d edition, p. 161.

† First edition, p. 158.

This case of Mr Travers's well exemplifies the type of hyperæmia from distension of vessels, especially where the constitutional powers have been severely depressed by treatment and regimen. In many of these cases the mischief is increased by injudicious treatment, until exhaustion from loss of blood, with one or more of its consequences, is induced, either reaction, or sinking, &c., or a more confirmed condition of anæmia, with deranged circulation through the cerebral vessels. The observations of Dr Abercrombie, already alluded to, are well worthy of remembrance.* Severe injuries to the head are also liable to be followed by a passive hyperæmia of this nature, quite independent of the existence of actual disease going on within the cranium, and in this way patients may suffer from imperfection of vision, vertigo, and headach, especially from excitement, long after the other symptoms of the injury have passed away; these symptoms themselves yielding to treatment at a longer or shorter period subsequently, or remaining permanent.

Treatment of Passive Hyperæmial Amaurosis.—The treatment of all these forms of passive hyperæmia should be conducted on the same principles, viz. to equalize the circulation, and restore the contractile power of the affected vessels, directing especial treatment to the visual apparatus, if the cure of exciting and proximate causes of amaurosis have not restored vision by their own removal. Where there is sufficient reactive power in the constitution, and the local symptoms are severe, or where the powers of the system have been invigorated by appropriate treatment, the moderate local abstraction of blood by cupping or leeches will always be found advantageous; but, on the contrary, where these qualifications are absent, loss of blood will always prove injurious. In equalizing the circulation, much good may frequently be obtained by cold sponging, followed by brisk frictions, either by coarse towels or the flesh-brush, placing the feet in hot and stimulating pediluvia, and keeping them subsequently well clad in warm garments. The head should be kept cool by wearing the hair short, cold sponging, &c., and all causes capable of increasing the local derangement of circulation must be carefully avoided, such as faults in the quantity or quality of the diet, mental exertion, or inquietude, indulgence in sleep, especially during a late hour in the morning, or a low position of the head during its continuance, &c. With the same views, early rising, exercise to the avoidance of fatigue, country air, mild aperients, with or without tonics, may be directed.

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* It is a law in pathology, and a curious fact, that in every organ the diminution of the quantity of blood, as well as the excess of what it should normally contain, produces disturbance of function: in both cases these derangements being precisely similar. Although the cause be different in these two instances, still they produce the same results, from the fact that the impairment of function depends, not on the *nature* of the cause, but its *operation*: thus, in both these instances, the healthy condition of the organ is interfered with, either by repletion or comparative emptiness of its vessels, the function being interrupted or failing from the alteration of the organ's normal condition, and not from any specific character in the hyperæmia or anæmia. In such cases a diagnosis is formed from other symptoms besides the local derangements in function—the blanched appearance of the surface of the body, the lips, inside of the mouth, &c. when general, (or if only local, and the part visible, by its anæmic condition,) the characters of the pulse and the tendency to syncope on assuming the erect posture, &c.

With especial regard to the treatment of the amaurosis, the systematic use of counter-irritation and mercury, I believe to be the best. A series of blisters applied, healed, and then reapplied to the back of the neck and behind the ears, is decidedly the best form of counter-irritation in these cases; their local action is most beneficial, whilst they do not exhaust by continued or profuse discharge. The action of the mercury should be very gentle, and continued for a sufficient length of time; for, besides improving the general health, I believe that it possesses the power of producing contraction in the dilated capillaries, quite independent of any influence on the general circulation. During the trial of the important measures I have mentioned, the local application of astringent collyria to the conjunctivæ is beneficial, by relieving the epiphora and local irritation, which, taken alone, are adequate to derange vision, without any connection with a similar pathological condition of the visual nervous system.

MECHANICAL HYPERÆMIA OF THE VISUAL NERVOUS SYSTEM.

A. *Venous retardation from the pressure of Tumours, &c.*—The return of venous blood from the head may be prevented from taking place normally by various mechanical causes, which may thus give rise to all the injurious effects of venous hyperæmia from other causes. I have seen protrusion, preternatural vascularity, and dimness of vision in the globes, produced by the immense size and pressure of the hypertrophied thyroid gland, besides the headach and other symptoms of cerebral derangement. Again, the simple effects of dress may prove quite sufficient; and many cases are clearly traceable to the injurious influences of tight neckcloths, &c. which even, if they do not solely occasion the mischief, have greatly increased the effects originating from some other noxious causes. Thus Zitzelius has mentioned the case of a boy who had drawn his neckcloth remarkably tight, and was whipping his top, stooping and rising alternately, when, after a short time, he fell down apoplectic. Besides the causes I have mentioned any tumours so situated as to cause a compressing power sufficiently great on the jugular veins, might produce the same effects; and diseases of the lungs, heart, and great vessels are fruitful sources.

Trnka* says, "Tumores varii pro varietate loci, quem obtinent, varie amaurosin producunt, nempe *colli* strumosi scrophulosive, jugularibus venis incubantes, ac sanguinis ab encephalo reditum ad cor remorantes; unde vasorum ophthalmicorum infarctus et nervi optici ac retinæ compressio atque amaurosis consequitur, quæ sublatis id genus tumoribus nonnunquam feliciter aboletur, quemadmodum Strackii juvenem apud Storckium accidisse videre est." Sic* G. Horstii æger cum ingentem tumorem, cui nattæ nomen, infra nucham 17 annis jam molestum auferri sivisset, visum sensim prorsus amisit."

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* Historia Amaurosis, Vol. i. p. 137. 8vo, Vols. ii. 1781.

B. *From affections of the heart and great vessels.*—This form of mechanical hyperæmia occurs either in the advanced stages of cardiac disease, where the circulation generally is retarded, or in those cases where the right auricle, ventricle, or pulmonary artery are chiefly affected. Here the jugular veins are preternaturally distended, or possess pulsation synchronous with the arteries.

Case.†—Lafin, a cook, aged 58, athletic, has enjoyed good health till lately. Six weeks from his admission he became affected with headach and complete amaurosis of the right eye, and incomplete of the left; pupils are contracted and immoveable; complains of pain in the back and shoulders, by which he is obliged to remain seated in bed; pulse and appetite natural; neither cough nor expectoration. Six weeks later he began to cough and expectorate considerable quantities of blood; the cough returns in paroxysms, and almost always brings a considerable quantity of scarlet and almost pure blood; respiration is feeble over the whole of the right side, particularly high up; heart presents signs of dilatation of the right side: pulse full, frequent, and smart.

He died on the seventeenth day of the hæmoptysis. On *post mortem* examination the heart was found dilated in all its cavities, but the orifices not contracted. The upper lobe of the left lung was occupied by an aneurismal sac, the size of a cocoa nut, formed by the transverse portion of the arch of the aorta, two inches above its escape from the pericardium. The left optic nerve was slightly atrophied after the decussation.

Remarks.—In the forgoing case I believe that the amaurosis was dependent on the mechanical retardation of the circulation of the head generally, and that the atrophy of the left optic nerve was itself secondary to the loss of vision. Is not the atrophy of the visual nervous apparatus always a result, and not a cause of loss of function? I must confess that I believe it myself to be so; regarding it as a symptom of the loss of function having been severe and continued, however this loss of function may have been produced, and never as an affection of primary origin. In the present instance, however, the atrophy existed in the same side as the incomplete amaurosis, and the side last affected. That the case was one of amaurosis from mechanical hyperæmia, appears to me sufficiently proved from its history and symptoms; it commenced with headach and derangement of both eyes, but complete in the right, although it is stated that the pupils were contracted and immoveable. The case, therefore, well illustrates the class into which I have subdivided mechanical hyperæmias.

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* P. 297.

† Vide Hope's Treatise on the Heart, &c. p. 608. 3d edition enlarged.

Amaurosis from hyperæmia dependent on sympathy with distant organs.—Derangements in the functions of the *primæ viæ*, liver, uterus, &c. produce amaurosis in different ways; either by direct sympathy, without any obvious pathological mode of action, when the sympathetic malady bears immediate and obvious relation to the primary affection, either increased by its increase, or relieved by its decrease, but always commencing and increasing after it, and bearing some certain relation in its symptoms to the seat, &c. of its originating cause, (appearing to act through the medium of the nervous system solely), or, on the contrary, cerebral hyperæmia is produced, which may vary in its intensity and characters, dependent partly on the nature and severity of the primary impairment of function, and partly on the irritability and constitutional peculiarities of the affected individual; thus, it may deserve the name of active determination, and even threaten apoplexy, or be passive in its characters, and come under the head of what I have termed venous congestion, facts which I have previously mentioned in connection with active and passive hyperæmias. These attacks of congestion and amaurosis may be either sudden, complete, and fatal, may rapidly disappear by active treatment, or may be slowly formed, very obstinate, or even proceed to the production of incurable results.*

It is of considerable importance to distinguish the presence of these affections in directing the most efficient treatment, especially as the primary cause of the sympathetic derangement is sometimes rather latent in its character, but may generally be detected by careful inquiry. As I have mentioned the peculiarity of symptoms of the different sympathetic derangements, of the means of diagnosis, &c. in a former paper on this subject,† I must now content myself with a reference to those opinions.

Mr Tyrrell‡ narrates the case of a gentleman who became the subject of amaurosis, with determination of blood to the head, from unusual indulgence in the pleasures of the table for several days in succession; he was speedily relieved by the abstraction of blood, purging, and spare diet. The same gentleman, at page 280, mentioned the case of a lad, aged 13, who had been suffering for many days with headach, giddiness, flushed countenance, intolerance of light, and imperfect and obscured vision; tongue loaded, red at the edges. On examination, an irregular indurated swelling was found in the right iliac region. A full dose of scammony and calomel produced a very copious discharge of hard scybala, with immediate relief; all the urgent symptoms subsided, and, after a second dose, he became completely convalescent. With Mr Tyrrell, I believe the tongue to be a very valuable guide in the diagnosis of derangements in the abdominal viscera, and feel convinced that its condition should never be overlooked among the symptoms, nor neglected in the treatment.

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* Vide author on the Diagnosis, Pathology, and Treatment of Amaurosis. Lancet, Vol. ii. 1840–41. pp. 7, 8, &c.

† Edinburgh Medical and Surgical Journal, January 1842.

‡ On the Eye, Vol. ii. p. 277.

CASE.—*Amaurosis* affecting both eyes, divergent strabismus, &c. arising from sympathetic abdominal irritation, preceded and accompanied by pyrosis.*—William Northcote, aged 36, is a healthy fresh-looking man, of sanguine temperament. He states that he has been employed about some manganese mines, but that his work is chiefly in the open air. His right eye became deranged about four years since; the affection commenced with muscæ and dimness of vision, the attack being preceded by severe indigestion, nausea, and occasional attacks of severe burning pain in the epigastrium, with acid eructations; these symptoms continuing whilst the sight failed gradually. About four months ago the sight of his left eye became affected, the vision was destroyed quite suddenly whilst engaged in work. For some time previous to its occurrence he suffered most severely from pyrosis, that is to say, he brought up a large quantity of transparent acid liquor chiefly in the morning after his breakfast, or from working harder than ordinary, or in using any powerful exertion. At the same time he suffered from other symptoms indicative of indigestion, and the common sympathetic phenomena to which derangements of the digestive functions give rise. He describes the occurrence of blindness in this eye as very sudden, as coming on whilst at work at his usual occupations; that he saw quite well in this organ, and then so suddenly became blind, that he likened it to the hand being instantaneously placed in front of the organ. At the time of its occurrence he fancied that he saw numerous sparks, and flashes of light, and fantastic shapes of more opaque matter flitting before the eye, appearances which have continued to trouble him ever since.

Causes.—He states that he is not aware of any other circumstances which could have favoured or induced the affection, save the greatly deranged state of his stomach, and chylopoietic functions which preceded and accompanied the separate attacks.

Symptoms.—At present (September 21, 1841), he complains of dulness and imperfection of vision in both eyes, being unable to discern objects with distinctness in either eye; they appear indistinct, clouded, and but ill-defined, and this to an equal extent with either eye. Muscæ and luminous spectra occasionally appear to flit before his eyes, but are not at present so troublesome as they were formerly. He complains of headach and occasional pain in the globes, which last, he says, is by no means so severe or frequent as it formerly was.

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* Vide author, Med. Gazette, Vol. i. 1841-2, p. 548.

The right eye is affected with divergent strabismus, and both globes appear more vascular than natural, the right in particular. The irides are light-coloured; the right gray, but the left of an uniform dull greenish hue. The pupils are not dilated when both eyes are open, but the right dilates when the left is closed, and possesses no independent motions from the alternate influence of light and shade; the left pupil does not, however, dilate when the right eye is closed, and it moves freely and fully when tested by the alternation of light and shade. The vessels of the head appear distended, and the countenance is bloated and flushed. Since he has been an in-patient of the infirmary, he states that his health has been good, with the exception of headach, to which he is extremely liable, and that his appetite and digestion are normal, and the condition of his bowels regular and healthy. His tongue was moist, but swollen, flabby, marked with the teeth, and covered with a whitish slimy fur. His pulse is good, and there is a complete absence of every symptom denoting nocturnal fever. Since his admission his health and sight have improved; and, as he has only been under treatment a fortnight, his case appears so far very favourable.

The treatment employed was mild and regular diet, repose of the organs, and the *Pil. Hydrarg.* v. *grs. om. noct.*, and *Pil. Colocyn.* c. *Ant. Pot. Tart.* p. r. n. After continuing this treatment some few weeks more without any increased benefit, he was allowed to return to the country.

Remarks.—The separate occurrence of blindness in the two eyes at the interval of nearly four years, although commencing and progressing with such different symptoms, as regards rapidity and severity, were, I feel little doubt in stating, essentially similar in their pathology and pathological causation, although the *modus operandi* was sudden in the last instance, but slow, prolonged, and progressive in the former. The remote pathology in both instances was clearly gastric derangement, which preceded and accompanied their origin, and complicated their further progress; in the first attack it was that condition of stomach which produced the more ordinary phenomena of gastric dyspepsia and gastrodynia; in the second pyrosis, viz. attacks of burning pain at the pit of the stomach, chiefly after breakfast, followed by the eructation of a considerable quantity of a clear, colourless, acid liquor. Among other sympathetic symptoms derangement of the cerebral circulation with hyperæmia of the visual nervous system generally, seem to have been produced. In both attacks the hyperæmia came under the denomination of "determination" of blood; in the first this local alteration of circulation was mild and gradual in its accession and chronic in its progress, while, in the second, a more acute attack of a similar kind was doubtless superadded to the previous condition, at once destroying vision, the condition of the vessels themselves predisposing, subsiding, however, shortly afterwards to its pristine state of derangement, or, at all events, a derangement not much more severe. If we examine the case we shall find those symptoms present which indicate that local pathology which I have sketched. There were present muscæ, luminous spectra, pain, and preternatural vascularity of the globes, great tendency to headach of a pulsatory kind, a flushed and tumid countenance, whilst the vessels of the head appeared full and distended.

I presume that the natural colour of this man's irides were gray, and that therefore the right retained its normal shade, whilst the left had undergone an uniform discoloration. My note-book says, it was of an uniform dull-greenish hue. It had not, however, lost its natural brilliancy or radiated appearance, nor was there displacement or bulging forwards, with or without thickening of its structure; hence, I conclude, that this alteration of colour was not inflammatory, but probably effected by some alteration in the *pigmentum nigrum* lining its inner surface, forming the "uvea," and deriving its origin from other changes produced by the general hyperæmia. As change of colour in the iris may be produced by sudden violence applied to the eye, and other causes acting more gradually during life, we may readily imagine this to be the case when we take into consideration the fact, that we are quite unable to account for the diversities in colour during health, and hence, of necessity, quite unable to explain the reasons for change of colour, and particular changes of colour during disease; for if we examine separately (removed from other parts of the eye) those irides, placed side by side, which during life have been of the most various and opposite colours, we shall find them all producing an exactly similar impression of colour on our visual organs,—a dull-grayish brown.

Strabismus affected the right eye, which was turned abnormally outwards, a fact which coincides with my previous observations, viz. that cases of divergent strabismus are nearly always produced by sympathetic derangement from abdominal disturbance. In proportion as the harmonious relation in function subsisting between the two eyes was disturbed, so in like manner their harmony of motion ceased, the globe became permanently everted, and maintained this relative position in the various movements of the eyeballs.

The treatment to be pursued in similar cases is a matter of some interest. It resolves itself into the treatment of the remote and of the proximate pathological cause, the correction of the gastric derangement according to our best present knowledge, and the treatment of the local hyperæmia by cupping from the nucha, according to those indications which the particulars of each individual case can alone supply; efficient counter-irritation in the neighbourhood, by the tartar emetic ointment, &c.; a continued constitutional action of mercury; the employment of measures calculated to keep the head cool and the feet warm, and attention to the general health.

Treatment of hyperæmial amaurosis from sympathy.—These cases require treatment of the sympathetic and treatment of the primary disorder. As regards the first, I have already fully entered into the subject under the heads of active and passive hyperæmias, whilst the second will greatly depend on the seat and nature of the affection. On these I shall not here enter, but only lay considerable stress on the necessity that exists of carefully weighing the diagnostic symptoms, of investigating the seat and peculiarities, in order to determine and direct the adaptation of remedial measures, to meet and relieve existing circumstances; for the relief and removal of the primary impairment of function, whatever be its cause, is a chief consideration in the relief and removal of those symptoms which are sympathetic or secondary.

The author has thus, by taking the visual nervous system as an example, endeavoured clearly to explain the general and local pathology of congestions in general, their origin and causes, as well as the principles which should direct our treatment, and he sincerely trusts that such may prove useful to some of his medical brethren.

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ART. IV.—*Practical Observations on the Diseases of Peru, described as they occur on the Coast and in the Sierra.* By ARCHIBALD SMITH, M. D. (Continued from Vol. lvi. p. 401.)

II.—DISEASES OF CERRO PASCO AND OTHER ELEVATED CLIMATES IN THE INTERIOR OF PERU.

THE Indian of the interior, who lives in the elevated and inclement parts of the pastoral or mining districts of Peru, is, like all the rest of Nature's works, admirably fitted for the situation in which he is placed. His lungs are capacious, bearing a due relation to the tenuity of the air which he inspires, and his limbs, though short, are well turned and muscular. He can ascend the steepest cliff with ease, and trot over what he calls pampa or plain, though in reality pretty uneven ground, with a weight of several arrobas in his "quipe" or burden of provision and bedding, &c. which he carries on his back.

The sons of the coast, on ascending the chains of the Andes, feel their breathing oppressed where the Indian experiences no such inconvenience, on account of the fuller development of his respiratory organs; and I have had frequent occasion to observe that, on these heights, where the respiration of the native of the coast becomes disturbed, his pulse is accelerated, and his lungs are called into much quicker action than natural. The free play of the lungs, however, is opposed by an accumulated charge of blood on them, or a considerable degree of congestion, proceeding, as I conceive, on the one hand, from the diminished pressure of the atmosphere admitting of much expansion in the circulating fluids, and, on the other hand, an augmented resistance in the dermal and pulmonary capillaries, from the usual agency of cold air, or cold conjoined with wet.

It is the observation of a Spanish physician, that "the winter's sun is injurious, because the body does not then perspire, but that the sun of summer does no harm though one be exposed to it, because then he perspires." The sun of Cerro Pasco, (which is a mining town upwards of 14,000 feet above the sea,) and equally elevated mountain districts, may always be said to be the winter's sun of the Spaniard; for the wet season is like a Scotch winter, and though in the dry season it shines brightly and warmly at noon, yet in the shade, the air is chillingly cold, and the nights are always frosty. Thus, whether the season be dry or wet, healthy cuticular action is checked; the balance of the sanguiferous system is perturbed, and the organ, in any individual, most prone to disease from such causes, is that which must suffer the onus of a disorder which immediately proceeds from a preternatural distension and consequent irregular action of the heart and arteries. Whatever bodily or mental exertion excites the circulating system under the various circumstances of altitude, atmospherical rarefaction and cold, is observed to affect the lungs and the head, &c., in most persons not adapted by their physical form to enjoy perfect health, and breathe freely on the frigid table-lands; and hence it is that strangers to these climates are so subject to sickness at stomach, dyspnœa, apoplexy, and various hæmorrhagic disorders, when they visit the ranges that border on the passes of the Cordilleras.*

I shall now give a brief account of some of the more prominent diseases of the lofty regions about 13,000 or 14,000 feet, or more, above the level of the ocean.

Veta, Seroche, La Puna, Mareo de la Cordillera, or the Cordillera-sickness.—A peculiar throbbing headach, with great sense of fulness at the temples, attended by much oppression and tension about the chest, and frequently sickness at stomach, are symptoms usually experienced for the few first days after crossing the Cordillera, or residence in Cerro Pasco. By walking fast, especially up hill, a great fulness is felt at the lungs, the temporal arteries throb violently, and headach is induced. In attempting to run, these symptoms come on very fast, and one is glad to rest to recover breath, or greater freedom of respiration. The keen frosty midnight air of a month of July, I once, with the utmost uneasiness, respired in a miserable hut at the Cordillera pass of Tucto; it communicated a peculiar cutting feel along the windpipe, and my sensations every moment till dawn were loaded with apprehensions lest some blood-vessel should give way in the lungs. I had every now and then to take in a long full breath, followed by a deep expiration, as if to remove congestion in the pulmonary circle.[*] Most young persons soon become so accustomed to the effects of a highly rarefied atmosphere, that headach and dyspnœa cease to be felt except on unusual exertion. Some individuals, however, and especially those of a full plethoric habit, never can pass the Cordillera, or reside in Cerro Pasco, without headach and more or less difficulty of breathing; and such individuals when crossing the breaks of the Cordillera, or travelling along high and frigid plains which the natives call Puna,[†] are exceedingly apt to be attacked with epistaxis, which naturally points out that, in their circumstances, subtraction of blood is a suitable remedy. Should the symptoms of congestion in the lungs or head be very great, bleeding may be requisite on the first attack of the disorder. It is also of great moment to unburden the bowels with a view to facilitate the freedom of circulation; and the person suffering from "veta"[‡] should use light nourishment and avoid spirituous beverages. Cold tea is an excellent and refreshing drink in the Cordillera, infinitely more favourable to the preservation of animal heat than either brandy or wine, and it has the advantage of not affecting the head, as spirituous drinks do, so as to augment the cordillera sickness.[§] The best way to avoid this disorder is to keep the surface and extremities warm, and to get under some roof before night comes on. The Indians themselves are very attentive

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* Cattle that feed near the snow line, where the pasture is very fattening, are, when in high condition, very prone to sudden death, and the natives attribute the event to the too full state of the blood-vessels in the animals cut off in this manner.

I recollect that in Cerro Pasco a fine bull-terrier belonging to one of the Cornish miners fell down dead, probably from apoplexy, when in the act of fondly jumping up, in acknowledgement of the caresses of his master or some one of his friends.

[*] On another occasion, and by a different route, I suffered severely from the seroche, which is the true Indian name for this Cordillera sickness, which Spaniards have compared to "mareo" or sea-sickness. At that time my breathing was panting and laborious, similar to what I had afterwards frequent attacks of when labouring under ague on the coast.

In tertiana, as in Cordillera sickness, I have seen the perspiration suppressed, with the arterial beats and respirations numerically increased together, and probably in the same ratio as in health; but yet the lungs were unable, in some instances, to free themselves of excessive congestion merely by their own efforts or functions. For in extreme cases I have witnessed during an ague fit the most distressing oppression of breathing, with an alarmingly turgid appearance of the neck and countenance, most urgently craving, and actually receiving ready relief from the free use of the lancet.

[†] Whence the synonyme "la puna" for the Cordillera sickness.

[‡] The veta, or vein, is a name given to the Cordillera sickness by miners, in allusion to a supposed vein of antimony, or some other metal, which they look upon as the cause of the mephitic emanations, which, they say, give rise to this illness.

[§] This is a fact to which my attention was called by one of the fathers of South American Independence, the illustrious General O'Higgins (in private life one of the most amiable and unpretending of men), who had such frequent occasions to traverse the heights of the Andes during his memorable campaigns.

to use warm clothing in these lofty regions or Punas. I have observed that, when they entered their huts at night, they did not sit with wet feet or stockings; and their beds were usually as warm as sheep and vicuna skins could make them.*

Those who cannot get free of dyspnœa or headach after some days residence in the Cerro, are at once freed of these symptoms by descending as low as the village of Quinoa, three leagues distant from Cerro Pasco, and after a few days they may again return to the mines, and probably escape a recurrence of this peculiar disorder.

Hæmoptysis.—This disease is by no means a frequent one in the interior of Peru; and I have, in treating of the diseases of the coast, so fully considered the influence which the climate of the Sierra exercises over consumptive and hæmoptic individuals, that in this place I shall offer but one or two remarks on hæmoptysis, as it appears to be chiefly seen in the mining districts. The cough attending an ordinary catarrh, in very high situations, is sometimes so severe as to induce hæmoptysis. In Cerro Pasco, the disease is rare. During a twelve months' residence in this place, I only witnessed one instance of it, and that occurred in the person of a large corpulent woman among the Europeans under my professional charge.

Hæmoptysis is, however, observed to proceed from particular local causes, in situations where mere altitude does not appear to have any such common effect; for example, it is a disease apt to attack furnace-men who are exposed to the fumes of sulphurous acid vapour, as is known to be peculiarly the case in the high quicksilver district of Jonta, in the province of Huamalies.

Cynanche Tonsillaris.—This, as might be predicted from the nature of the climate, is a very frequent disease in Cerro Pasco. I have met with many examples of it, but for its cure seldom had occasion to employ the lancet; and as for leeches they need not be looked for in this mining locality. This affection commonly terminated favourably in the course of a few days by opening the bowels, using the foot-bath, inhaling the vapour of warm water, drinking warm diluents, and observing confinement within doors, warmth, and low diet.

Cynanche Pharyngea.—This disease is one of the most common in Cerro Pasco during the dry season, especially in the months of August and September, and it is quite independent of any swelling of the tonsils. The fauces and pharynx appear dry and partially incrusted with mucous matter, especially in the morning, which it is not easy to detach, and deglutition is often painful. The vessels of the pharynx are greatly distended, and one instance came under my observation where the pharyngitis, having become chronic, serious bleedings arose from the gorged state of the vessels of the inflamed parts. The only remedy for this affection, when very serious, is change of season or climate, which, in most cases, according to my experience, afford a sure and speedy cure. But in the hæmorrhagic instance of it to which I have just alluded, the gentleman affected had suffered from the inflammation of the pharynx in Lima after his return from a tour to Pasco; and when at sea, on his homeward voyage, this local disorder still continued, and subjected him to most serious attacks of hæmorrhage from the ruptured vessels of the parts affected, which were not under the control of ligature or compression.

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* Of the two species of llama,—the Paco and Huanaco, the former comprises the Alppaco and Vicuna: the latter the wild and domesticated Huanaco. The domesticated Huanaco is called *llama-camkcani*, from the Indian or Quichua word *Camkcani*, which signifies to labour or to work. The vicuna is named from the word viqacuni to whistle; for this animal warns his companions of approaching danger by a very shrill loud whistle. And Alp-paco is a compound word, derived from ppaco, which in Quichua means russet or brown, and *Alppa*, land or country: hence Alp-paco or the ppaco of the country, in contradistinction to the European sheep, compared to the ppaco when first introduced by the Spaniards.

Cynanche Trachealis.—The only case of croup which I have seen in Cerro Pasco, or its environs, originated in symptoms of a spurious nature, but it became progressively more and more genuine and defined in its character, and soon proved fatal to the child affected with it. Indian children seem in a great measure proof against this malady, which has the name of being most destructive to the infant offspring of the white race. I should, therefore, recommend that the white child or infant attacked by croup at Cerro be instantly removed to one of the adjacent temperate valleys, where the mild air breathed by the patient will in all probability prove a most efficacious remedy.

Catarrh.—This disease, characterized by cough and uneasiness in the chest, some degree of fever, with irritation or inflammation of the mucous membrane of the eyes, nose, fauces, and bronchiæ, &c. is a disease very prevalent in Cerro Pasco; and when properly and timeously attended to is easily cured, in most instances, by warm and dry clothing, laxatives, demulcents, opiates, diaphoretics, and pediluvia. Bleeding or blistering are rarely required, except when the patient has neglected his cold in its early stage.

But I have to mention another species of catarrh of an epidemic nature, which came under my notice in Cerro Pasco. About the end of September 1826, the English miners and artisans under my professional charge were almost in a body taken ill with a catarrhal affection, which announced itself by cold shivering, followed by general muscular and wandering pains, and not unfrequently a slight headach; cough and pain in the chest, or one of these symptoms without the other; and almost in every case, a heavy fixed pain in the line of the recti muscles of the abdomen. In the cure of this malady, the men, instantly that they were attacked, were desired to betake themselves to bed. An active purgative was immediately administered, and after its operation was over, I gave an anodyne of opium or hyoscyamus, which was followed by a warm sweating regimen. Under this treatment, in about forty cases, I only lost one individual, who was elderly, of a broken constitution, and habitually asthmatic; and a solution of the disease was generally procured in course of the first twenty-four hours from its invasion. What treatment was adopted by the natives in this epidemic, I cannot state, but amongst them the disease proved a most fatal one. Every morning, for a fortnight, they were carried to their graves by dozens, though probably the whole amount of the migratory population of the mines of Pasco did not at this period exceed from 4000 to 5000 souls. At the mining Haciendas, or the amalgamating establishments in the vicinity of *the Cerro,* the epidemic proved very severe; but it is curious to observe how this scourge was always less felt in proportion as the elevation of place became diminished; that is, as we entered the valleys in the neighbourhood, where the atmospheric temperature was moderate and benign. We traced this disease in its progress northward from Cerro Pasco, along the ravine or narrow glen that leads into Huanuco, and long before it reached this Elysian vale, it died away on the salutary breezes from the Montana by the river Huallaga. It scarcely reached Huariaca, eight leagues below the mines, when it assumed the form of a simple catarrh, though apparently so general that, even under this mild character, it allowed no one to escape its influence.

Pleurisy or Costado.—This formidable disease, with the single exception of catarrh, I found during one year's continued residence at the mines of Pasco, to be by far the most frequent among the European servants of the Pasco Peruvian Mining Company. It almost always presented itself under an acute form. I have generally seen it characterized by cough and a fixed pain in some part of the chest, increased on inspiration or coughing; difficulty of breathing, particularly in the reclining posture; turgid countenance, suffused eyes, and headach; full and frequent pulse with high pyrexia. I have sometimes seen the expectoration sanguineous, but not often so. Not only in Cerro Pasco, but throughout the whole extent of the high mountain districts of Peru, this disease is held in terror by all classes of the population, whether native or foreign. We are perhaps safe in assuming that half the Indians who die in the mineral district of Pasco and the adjacent table-land, perish of this disease; for, excepting occasional epidemics, as small-pox or influenza, besides the *Costado,* they hardly know any other fatal disease but their Tabardillo, a sort of nervous fever, more or less inflammatory in its commencement, of which I shall presently take notice. The occasional causes of the Costado are always in active operation in the inland parts of Peru, along the lofty ranges and mining districts. The changeableness of the state of the atmosphere, bad accommodation or lodging, changes from wet to frosty weather in April and May, and from dry to rain and sleet in October and November; exposure to wet in the mines, or coming out at midnight with the body overheated from the warm niches in deep excavations, after hard subterranean labour; these I have found to be the chief occasional causes of pulmonic inflammation among the Cornish miners engaged in the works of the English company abovementioned.

This acute disease demands active treatment. The lancet early and vigorously applied here affords our only hope. The natives, I understood, used small and frequent bleedings even up to a very advanced period of the disease; but the first and second general bleeding in a strong young man should not be under twenty ounces, which on the coast would be considered very excessive. By attending to this practice, I never had occasion to bleed my patients in this disease, a third time; but of course I visited them from the beginning. In this way, and afterwards opening the bowels by clysters or some mild purgative, I always had the good fortune to arrest the progress of this disease in course of the first twelve or sixteen hours; and the treatment was again conducted to a happy conclusion by low and cooling diet, the seasonable use of laxatives, diaphoretics, and anodynes, the foot-bath and blisters, with the administration of foxglove. In severe cases, followed by much debility, we were accustomed to send our men to convalesce in the mild and temperate curacy of Huariaca, where their strength and spirits were quickly restored.

Tabardillo.—This, of all diseases, is the most dreaded, and when it occurs, the most fatal among all classes of the inhabitants of the high Sierra, and especially the Indian race.

This name is given to any fever which is attended with cephalic and nervous symptoms—such as coma, delirium, intolerance of light, tremors, *subsultus tendinum*; and, I may add, dark feculent stools, a furred dry tongue, tending often to brown or black; with dry hot skin or partial sweats, and a frequent small pulse. More or fewer of these symptoms, especially with a marked determination of blood to the head, and occurring in greater or less intensity, are considered to deserve the name of Tabardillo. This fever of the Sierra, indeed, reminds one of the pernicious fever of the coast. It is, in as far as I could trace, merely sporadic, never contagious nor epidemic. The disease, in its first attack, may appear with pain in the lungs, the pleura, the stomach, or intestines, &c., indicating local irritation and congestion, or inflammation of some one or other of these organs. Hence the common distinctions, "costado entabardillado," and "tabardillo entripado," viz. tabardillo with pleurisy, or tabardillo with gastric or intestinal disease. The head alone may, from the first, be chiefly affected, and attended with pyrexia; and, as the disease further developes itself, some of the abdominal viscera may become disordered. In some intense forms, all may be simultaneously affected; the patient awaking from a debauch and finding himself with rheumatic pains, headach, cough, or pain in the bowels, &c. &c. The worst appearance of this formidable illness is usually that which arises during the dry season from May to November, when in the Sierra the scorching sun beams are shed abroad in a cloudless sky at noon. Those who are greatly agitated in mind and body, and exposed to the sun when its rays are concentrated and reverberated in some narrow valley wherein the atmosphere is not freely circulated, are apt to be seized with this fever; but by far the most frequent cause of it is intemperance, and the most usual victim to it is the unfortunate Indian. His own or his neighbour's Saints' day, invites him to eat, drink, and be merry. He exceeds in eating "picantes" or highly spiced dishes, and drinks himself to forgetfulness with chicha or spirits, most commonly both; he revels all night, and towards dawn, overcome by uproar, drink, and want of sleep, he saunters homeward; but goes not far when, exposed to a freezing atmosphere, he lays stretched on the ground in a lethargic sleep, from which, in a few hours, he awakes half-broiled under a powerful sun. Disease is upon him; his head aches, his stomach is out of order, his mouth is parched, and he longs for water to cool his blood. He fevers, and there is a declared tabardillo.

The tabardillo of the rainy season may, if I mistake not, be characterized, for the most part, by a greater complication in the symptoms, less rapid prostration of strength, and a less rapid transition of the fever to the strictly nervous character. It appears more frequently in what might be considered a symptomatic form, accompanied with evident lesion of function in some of the thoracic or abdominal viscera, as above adverted to. The cause, however, is, as I have stated, generally intemperance and indigestion, occasioned at the celebration of feasts, followed by sleeping,—not as in the former instance, on the frosty ground to be half-frozen in drunken sleep, and again scorched in the succeeding sun; but by sleeping uncovered on the wet and often miry ground exposed to rain, hail, or snow. Were it not for tabardillo and costado Indians would attain a great age; and the cause of their death, as well as many of their moral ills, they frequently owe to their misguided sentiments of devotion. For, let it be borne in mind that, as there are as many feast days held in every village as there are images of tutelar saints or separate names among its people, there is a continual routine of saint-day keeping, which takes them off useful occupation, involves them in debt, and encourages riot and debauchery, for which they too often forfeit their health or their lives.

Cure of Tabardillo.—This is a disease, the treatment of which I had few opportunities to superintend; for the Indians have a method of cure of their own, though I fear they often do more harm than good in their efforts to extinguish a malady so much and justly dreaded by them. The remedies resorted to must greatly depend on the variety of symptoms that present themselves in any particular instance, and not a little, upon the history of the case; but, however, two obvious indications present themselves in a general view, viz. 1*st*, to remove irritation from the bowels; and 2*dly*, to restore the natural freedom of the circulation and secretions. To attain these two important ends, the self-taught Indian has two particular remedies—the one a purgative, the other a very singular sort of vapour bath. The purgative consists of a common root in the Sierra, well known under the name of "Huachangana," which is frequently administered by them in their disorders. Given in very small quantity it operates so powerfully that, even without the aid of the lancet, it appears to be of itself capable of quickly lowering the powers of life; and when allowed to act freely, it produces perfect exhaustion. But when the Indian desires to check the excessive purging or hypercatharsis induced by the huachangana, he does so almost instantaneously by a drink of cold water. The vapour-bath, which is, I believe, more resorted to in chronic rheumatism than in tabardillo, consists of the pot of Mote or Indian corn boiled for domestic purposes. Without pouring off the boiling water, the pot full of scalding "mote" being covered with an old poncho or piece of blanket, is accommodated in a wooden trough placed between the sick man's knees in bed, and, the patient being at the same time well covered, the vapour from the pot soon forms a sultry atmosphere around his body, and he is thus thrown into a profuse perspiration.

As a last resource in the tabardillo, an Indian, when he despairs of his patient's recovery by other means, washes the feverish body all over with stale urine, which, from its ammoniacal ingredients, may prove an useful stimulant, and after this process is ended he wraps him in a blanket or woollen poncho, and then leaves him to the priest, and to his fate—to live or die as may prove his lot.

Rheumatism, in both its acute and chronic form, is not an unfrequent disease in Cerro Pasco; and is prevalent throughout the Sierrania or hill-land in general. Those most subject to it are Europeans and their descendants, especially curates, who, for the most part, have either been born, or long resided on the coast. Nor is this to be wondered at, when we consider their bleak and cold residences, in such places as Junin, Ninacaca, or Ondores, all on the table-land in the neighbourhood of Pasco. My friend, Mr Benavides, the late curate of Ondores, once suffered so severely from this disease as to have had tumours formed on the joints, which, after occasioning severe suffering, yielded at length to warm-baths and the milder temperature of Tarma, whither he repaired for relief, after having in vain endeavoured to cure himself in his dreary curacy. I hope that he did much to humanize and Christianize his flock; among whom, as he told me, he found one Indian youth who still believed that the sun was God—"*que el sol era Dios.*"* It is not unfrequent to see individuals in Puna districts crippled in their joints from the effects of rheumatism. For this disease nature provides the inhabitants of Cerro Pasco with the convenient sulphurous springs of Yanahuanca, which are about nine leagues from Pasco, in a fine temperate climate, where the profuse perspirations induced by immersion in the baths is not liable to be checked by the circumambient atmosphere, as is the case at Yauli, Hualliay and other elevated and frigid situations in which natural hot springs are to be found. The two springs at Yanahuanca (the waters of which prove laxative when taken inwardly) are contiguous, and as the one is but agreeably tepid while the other is hot enough to boil eggs, the waters from each, conducted through proper channels, may be made to combine in the bath at any desired degree of temperature from tepid to boiling. It will be convenient to recollect that, for patients from Cerro Pasco, or other cold and inhospitable localities, who find relief at these baths, it would be prudent to descend for a week or ten days to Huacar or Ambo to convalesce thoroughly, before they return to a cold climate among the higher towns and villages of the neighbouring country.

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* The ancient Peruvians were sun-worshippers.

Zurumpe or Snow Blindness.—This is an extremely severe and painful inflammation of the conjunctiva and palpebræ, with blindness of one or two days duration, not the unusual effect of travelling over the high table-lands when covered with snow. With regard to the treatment it may be observed that, as in severe cases pyrexia is naturally the consequence of the ophthalmia, both general and local bleeding may be required. Open bowels, cooling drink and diet, and mild emollient and cooling poultices, are commonly resorted to. A very favourite and popular remedy consists of well-boiled and finely-pulped apples, &c. which may be found to reduce the acute inflammation, and afterwards suitable astringent collyria, answer every purpose. For healing applications to the eyes in such cases, the natives use a piece of raw meat as a convenient poultice ; and resort to lotions of cold spring water sharpened with a few drops of lemon-juice or Italia brandy. Of the snow-blindness, a very interesting account is given in the memoirs of General Miller, as it attacked a division of the patriot army on a march from Cuzco to Puno, when exposed to a heavy fall of snow. He observes that " the only relief is a poultice of snow, but as that melts away the torture returns." (See his Memoirs, Vol. ii. p. 218.)

Spongy Gums.—This is a very usual disease in Cerro Pasco and the surrounding heights. It does not depend on exposure to mercurial fumes, because it is alike frequent in those who are and are not exposed to this source of disorder ; neither is it ever attended with any general symptoms of scurvy, for which reason, it can hardly be considered a scorbutic affection, though it is vulgarly called by the natives *scorbuto* or scurvy. The gums are swollen, bleed easily when only gently rubbed, and sometimes they are partially ulcerated around the margins. Tincture of bark and myrrh are in these instances useful local applications ; and in the worst case of it ever witnessed by me, the sores were cured by dressings of cotton dipped in tincture of catechu. In this affection it is of the utmost importance to regulate the bowels, which, to the best of my knowledge, are often found in an unhealthy state.

Indigestion and Colic.—The former of these disorders, which are here classed together, very commonly occasions the latter ; and though the digestive functions are generally performed with great regularity and vigour in the more temperate districts of the Sierra, yet in frigid elevations like that of Pasco, biliary disorders are apt to occur. But the most common causes of well-marked indigestion and severe colic, are irregularities in eating and drinking committed on great festival occasions, and particularly eating that favourite article throughout the Sierra, *queso picante*, or cheese made excessively hot with red agi pepper. When attended to from the beginning, these indigestions, and consequent colics, are readily removed by taking warm water, so as to throw off the irritating contents of the stomach by an act of vomiting; and should colic pains or griping yet remain, health will be restored, generally at least, by purgative clysters, with oily inunction to the abdomen, or by some convenient purgative followed by an anodyne.

Hepatitis—Gastritis.—Gastro-hepatic disorders are sometimes very severe among Europeans who sojourn at the mines of Pasco. Chronic hepatitis appears to be a far more general affection than simple gastritis among the white population of the Sierra; but liver complaint, I think, seldom originates in these high situations, though individuals who may have resided for some time on the coast or lived in some warm climate, are very apt to have this organ more or less affected in the higher villages of the Sierra, where the secretion of bile is sometimes known to be excessive. I attended a gentleman of the P. Peruvian Mining Company, who was affected in Cerro Pasco with a very exuberant secretion of bile,—to such a degree as to occasion jaundice, accompanied with headach, and frequent vomiting and evacuations of large portions of bile without any admixture of mucous matter. Notwithstanding that vomiting in this case was exceedingly troublesome, and the sickness great which attended the regurgitation of bile into the stomach, which was again ejected by the mouth in large quantities, yet no pain was felt in the hypochondriac or epigastric regions to indicate the presence of inflammation. The symptoms characteristic of jaundice were in five or six days removed; but, then, great irritability at stomach remained; and bilious vomiting, morning headach, and mostly sleepless nights, threatened inevitable starvation and emaciation. I saw this disease day after day gaining such powerful ascendency over all the means that could be devised to oppose it, that I determined upon accompanying the patient into a neighbouring valley where the climate was temperate and mild. On the first day of our departure from Cerro Pasco, such was his weakly state that he was hardly able to ride a journey of two leagues, but the same evening he both ate and slept well; and, in a very few days afterwards, he rode in one day, over very uneven ground, from Huariaca to Quicacan, a journey of twelve leagues, or about forty miles, not only without fatigue but with an increased buoyancy of spirits and a general feeling of perfect health. At the close of sixteen days absence he again returned to Cerro Pasco strong and apparently free of disease; yet, without any want of due exercise, or being accusable of any sort of irregularity either in diet or regimen, in course of two days he had a renewal of frequent bilious vomiting, headach, and sleepless nights. A cup of coffee or chocolate taken early in the morning, proved of great service in relieving the head, by promoting the evacuation of a copious daily stool, consisting of semi-liquid, dark, and bilious-looking matter, without any share of slime or mucus; and after this motion, the headach wore away for the remainder of the day: this simple mode of relief, of all others, was the most productive of benefit. He left few of the usual means of allaying irritation or restoring the balance of the circulating system untried during this attack; but after twenty days continuance in a remarkably spirited and long-suffering patient, the digestive organs became at last so irritable that the mere sight of food, though asked for by the patient himself, excited an irresistible desire to vomit; and thus he had to forsake an important trust. As a last alternative, he again changed climate, which, as before, produced the most marked relief, though it did not at once remove the immediate cause of the disease, which appeared to consist of gall-stones, for afterwards he voided some of them; and he had, long before he left England, been subject to attacks of nephritis, and accustomed to pass sabulous matter with his urine, though it is worthy of notice that this gravelly disorder did not continue in Peru.

Enteritis, Diarrhœa, and Dysentery.—These are diseases by no means rare in the more elevated regions of Peru, and often arise from the same occasional causes. The continued action of cold and moisture on the surface of the body benumbs and contracts the cuticular capillaries, and repels the blood to the internal vessels. Hence, chills come on, followed by griping in the bowels; and, after some time, diarrhœa, dysentery, or enteritis, may appear. If the sympathetic constriction of the intestinal exhalents be very obstinate, the result, we may suppose, will be enteritis; if this constriction be less intense, and that spontaneously, or by the aid of warmth and diluents, the exhalents recover their undisturbed freedom of action, and pour forth serous fluid; they thus unload the vessels that terminate in them, and, by a copious exhalation, produce a watery diarrhœa.

But, again, when in any individual the muciparous organs of the intestinal passages are the parts more ready to take upon them increased action, in consequence of the same occasional causes of external cold and damp, &c., it appears that the intestinal as well as the cuticular exhalents may continue to be locked up for an indefinite period to the exclusion of serous diarrhœa, without the necessary supervention of enteritis. When the inflammation of the mucous surface is moderate, the mucous secretion is abundantly increased, and gives rise to intestinal catarrh—but, when this inflammation is more acute, it is attended by a very vitiated mucous and follicular, or even a sanguineous, discharge. The highly irritated or inflamed mucous membrane of the intestines is thus ready to pass into a dysenteric state; for increased intestinal irritability or sensibility predisposes to a spasmodic contraction of the muscular fibres of the intestines; and gives rise to detention of vitiated intestinal secretions, and fæces: circumstances which, if not soon removed, bring tenesmus, sanguineous stools, and fever in their train: completing the outline of a well-defined dysentery.

The dysentery contracted in the Sierra rarely, if ever, assumes in the elevated or more temperate climates of the interior, the alarming character and precipitous course which attacks of the same disease do on the coast, when associated with well-marked hepatic disorder. Even though dysentery should attack one affected with chronic visceral obstructions in the Sierra, it is apt to become a chronic disease, which may last for years; instead of an acute attack which, if not speedily arrested, will, on the coast, very often, prove fatal in a few days or weeks.

I have known in the Cerro, a case of this disorder brought on by lying out in a cold and wet night under the shelter of a rock at the foot of the Cordillera. By proper attention to diet, clothing, and opening medicine, after some weeks, it dwindled into an ordinary diarrhœa, which proved curable in a few days by a little rhubarb and magnesia in the morning, and an anodyne at night. I have also tried the calomel and opium, with perfect success, in a case to which my attention was called in the temperate climate of Tarma, two days journey from Cerro Pasco. In this case the symptoms were not very acute or urgent, for the young woman affected with it was able to go about, though her health had suffered much from the effects of the disease. Cases of chronic dysentery, attended with ulceration in the rectum, and large discharges of blood when at stool, are found in the cool and temperate valleys, to yield to injections of milk with laudanum; infusion of bark with laudanum; clysters of the decoction of the stone of the fruit called palta,* which is extremely astringent; while accumulations in the bowels are prevented by occasional doses of rhubarb or castor oil.

Apoplexy and Palsy.—In Cerro Pasco, I was often struck by the livid lips, blood-shot eyes, and purple-red appearance of the countenances of many of the old miners or inhabitants; and this variety of physiognomy seemed to depend on climate more than on the habits of the individuals. Where such fulness of the vessels as this state of countenance indicates is habitual, sanguineous apoplexy and palsy may be supposed to be diseases of no rare occurrence, though the cases that came under my notice appeared in stout and robust young men from Europe, or from the coast of Peru. After the immediate danger of the apoplectic attack is removed by timeous depletion and purging, &c. the patient should be transported, with the least possible delay, to a milder climate and a less rarefied atmosphere; for in such cases, it is only through the advantage of a favourable climate that remedies may be made happily to co-operate with nature in procuring a restoration to health.

There is a peculiar kind of palsy which is seen in mining districts, and is known to proceed from exposure to the fumes of mercury during the process of purifying the silver from its amalgam, or from inhaling the vapours that arise from quicksilver furnaces, which sometimes happens where quicksilver mines are wrought; as, for example, at Jonta or Huancavilica, and those affected by it are said to be *azogado*, that is, under the influence of azogue or quicksilver.

For persons thus diseased, the best line of management consists in visiting one of the neighbouring valleys where the air is temperate, and where warm mineral springs are to be found, such as the sulphurous springs of Yanahuanca, which are famous for the cure of this sort of palsy, as well as a variety of chronic, and particularly obstinate cutaneous diseases. By drinking daily a sufficient quantity of this sulphurous water, to keep the bowels easy, and by living temperately, we are assured that many paralytic individuals are restored to health. And the unfortunate azogado who does not derive benefit from air and exercise, together with these waters, or others of similar quality in the mildest valleys, will derive but little improvement, in my humble opinion, from the prescriptions of the faculty, or remedies of the apothecary.

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* "Palta" or alligator-pear.

(To be continued.)

Art. V.—*On the Function of the Spinal Cord in Cold-blooded Animals, in reference to Sensation and Voluntary Motion remaining after removal of the Cerebrum, &c.* By George Paton, M. D.

Sensation and feeling are terms used in nearly a synonymous sense, denoting, 1. the mere feeling itself, without reference to the external cause or object that produces it; and then it is used synonymously with being conscious, characterizing the being which is the subject of it, as a sentient being, and distinct from the inanimate and inorganic world. " Pain of every kind," says Dr Reid in his Essays on the Powers of the Human Mind, " is an uneasy sensation. When I am pained, I cannot say that the pain I feel is one thing, and that my feeling it is another thing. They are one and the same thing, and cannot be disjoined even in imagination. Pain when it is not felt has no existence. It can neither be greater nor less in degree or duration, nor anything else in kind than it is felt to be. It cannot exist by itself, nor in any subject but a sentient being;" and again he says, " when I am pained, I do not say that I perceive pain, but that I feel it, or that I am conscious of it." 2. Sensation is often employed by medical writers to denote the communication of an external impression to the conscious mind, as when, on the application of heat or cold to the surface of the body, we say that we feel these things, meaning that the impression produced on the surface of the body or extremities of the nerves, is communicated to the mind, or, in other words, that we have a perception of the external impression, which is the proper and philosophical term for expressing such an idea.

By voluntary motion is to be understood that power which an animal possesses of regulating, directing, or restraining the movements of its body, according to the determination of its will, or as the circumstances of the case demand. In short, it implies that the movements of the animal are under its control, and not involuntary and automatic, and this may be either when the act originates in the mind itself, in which case it is often termed spontaneous motion, as it takes place without any apparent cause exciting it; or when it arises in consequence of an impression produced upon the body being felt or perceived by the individual. But in either case, it is strictly voluntary motion, as the nature of the action is the same, being a distinct power exerted by the individual,—differing only in the mode in which it originates.

And with regard to the existence of sensation and voluntary motion in decapitated animals, or in animals deprived of their cerebrum; this, it is evident, can only be ascertained by comparing the particular movements and actions which they manifest in that state, with what we witness in these that are unmutilated, or by comparing the movements of a decapitated animal, with the movements and spasmodic actions of an animal into which we are certain neither sensation nor volition enters. If we can identify the particular movements in either case, we obtain a proper data for our decision, and one on which we can rely for the elucidation of the subject, and as it is of importance to recognize the various kinds of movements that take place in vertebrated animals, without being what may be termed spontaneous, in the manner in which we have defined the term, viz. in which the impulse originates in the mind itself, and not in consequence of any external impressions. These, we conceive, may be comprised under the following heads.

I. Those which result from sensation as a necessary cause, and the performance of which is under the control of the will, and is, therefore, strictly termed voluntary action. Under this class is comprised the principal part of those movements that are witnessed in our conduct in life, as our actions are in a great measure determined by the nature of the impressions produced upon the body by external things, as when we move the hand or foot to relieve it from the irritation to which it is exposed, or change our position because we feel it disagreeable.

II. Those which are connected with sensation, but the performance of which is independent of our will, and is therefore termed involuntary; as the act of sneezing from irritation of the nostrils, or coughing from irritation of the bronchi, &c.

III. Those in which sensation is not present, nor necessary to the performance of the movement, as the act of deglutition, contraction of the iris, &c.

In all these cases and classes of movements, it has been shown by experiments, that there must be an intimate relation between the afferent and efferent nerves of the part, or that which conveys the impression to the medulla, and that which reflects or conveys it from it, otherwise the movement cannot take place.

But still there is a material difference between the character of these movements. For to those of the first class, the agency of the mind is required, and enters as an essential element into it, as without the knowledge or consent of the will, no action can be said to be voluntary, and the circumstance which characterizes actions of this kind, and by which they are distinguished or observed to differ from every other, is, that they appear to be performed with design, or to be varied according to the nature of the case, and in order to the attainment of a particular end.

In the other class of movements, the agency and the consent of the mind is not required, as they take place independent of it, being incapable of being prevented or controlled by the will of the individual; and the circumstance that characterizes movements of this kind is, that they are performed without change or variation, every successive movement being a repetition of the former, and bear no evidence of design on the part of the animal, or of any determinating power being exerted to the production of a specific end. But of sensation being present in these movements whilst the action is involuntary, we can have no proof from animals which are the subject of experiments, as they are not able to express their sentiments or feelings, and the movement does not indicate it; it being only from man who is able to express what he feels, that such a class of movements have been determined. But when this has been established to be the case in man, it is not unreasonable to suppose that the same thing takes place in animals similarly constituted, when subjected to similar influence, and that there is a class of movements in them characterized by sensation being present, and the action involuntary. On the other hand, that class of movements which is totally unconnected with sensation, and purely involuntary and automatic, has been considered as distinctly developed in decapitated animals. Instances of this have been recorded and fully described as having been witnessed in the human subject, when, from disease of, or pressure on the spinal cord, movements have been produced in the lower extremities by irritation of the feet, and yet the individual felt no sensation, and was totally unconscious of the movements; and as in this case the impression that is conveyed to the spinal cord by the afferent nerve is merely reflected or conveyed back by the efferent or motor nerve, it has been termed the reflex action, and is considered by some physiologists of the present day as depending on a distinct system of nerves termed the excito-motory system, the centre of which they consider the *spinalis medulla*, and having no communication with the cerebrum, which they consider the centre of the senso-motory system. Others, however, are of opinion that these phenomena are to be accounted for on a very different principle.

The great point then to be determined is, Do these movements that are witnessed in decapitated animals, or in animals deprived of their cerebrum, correspond to the voluntary movements of animals that are unmutilated? Or are they characteristic of design, or of being varied and directed to the attainment of an end? If so, then we are certain that both sensation and voluntary motion remains, and that the movements cannot be accounted for on the excito-motory system. Or do they correspond to the involuntary and automatic movements that take place independent of sensation and volition, and bear no evidence of design, or of any determinating power being exerted to the attainment of an end? Then, we must admit, that neither sensation nor voluntary power remains in a decapitated animal.

But previously to relating the experiments which I have performed relative to this subject, I shall make a few statements respecting the nervous system of the *Rana*] *esculenta* or frog, as this animal has principally been the subject of experiment in endeavouring to determine this point.

In the nervous system of the frog, the cerebrum, or brain proper, consists of two small lobes, situated at the upper part of the *medulla oblongata*, into which the anterior portion of the cord is prolonged; but the posterior division of the cord does not seem to enter it, but to terminate at the upper part of the *medulla oblongata;* the fibres of the one side going over and uniting with those of the other side, forming, as it were, a small arch below which a needle may be passed without injuring the fibres.

The spinal system extends from the upper part of the *medulla oblongata* to the caudal bone of the vertebræ, into which it is partially prolonged, and during its course, it gives off four cerebral nerves from the *medulla oblongata*, viz. the trigeminus or fifth pair.* The abducens, or sixth pair, which in the frog is the principal motor nerve of the eye, the auditory, or seventh pair, and the *par vagum*, or eighth pair. Besides these cerebral nerves, it gives off ten pairs of spinal nerves, or, more properly speaking, nine pairs, which pass through the intervertebral foramina, and a tenth, which passes through a foramen in the caudal bone, and is a small nerve on which a ganglion is placed. The *medulla oblongata* becomes considerably expanded; and the upper portion of the end, which is evidently a continuation of the same fibres, retains very considerable enlargement till about the sixth vertebra, when it becomes much diminished in diameter. It may also be observed that the first pair of spinal nerves are analogous to cerebral nerves in the higher order of animals, being distributed to the larynx and the tongue, and have been considered by Volkmann as corresponding to the hypo-glossus, or ninth pair. But they appear to us more strictly to resemble the recurrent or inferior division of the *par vagum*, as the movements of the larynx are affected principally by these and a small branch from the second pair, or brachial plexus; and respiration is carried on, after division of the branches of the *par vagum;* and though it becomes laborious, is much less affected than in the case of warm-blooded animals, no doubt connected with the particular structure of the part, and mode of respiration in the frog, but still sufficiently showing the influence of these nerves in the performance of this function.

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* The trigeminus, or fifth pair, consists of two roots, on one of which a ganglion is placed. It is principally distributed to the muscles and integuments of the head, but sends a small branch down to the lower jaw, which, in its course, unites with a branch of the seventh pair, and afterwards with a branch from the *par vagum*, which running to the angle of the jaw, divides into two branches, one of which proceeds upwards to the head, and the other to the lower jaw. Irritation of this nerve at the point of union produces contraction of the muscles of the angle of the jaw. The abducens, or sixth pair, has been considered by Volkmann as the principal motor nerve of the eye, as, on irritating its root, the eye is drawn inwards, and covered by the *membrana nictitans*. Its action is beautifully seen in the case of a frog brought under the influence of strychnine. The seventh pair is distributed principally to the organ of hearing, but a branch of this nerve unites, as we have stated, with a branch of the fifth pair, before that branch unites with the branch of the *par vagum*. The eighth, or, strictly speaking, the *par vagum*, arises immediately behind the seventh pair, by two roots, which pass out at what may be termed the posterior condyloid foramen, and shortly after emerging from it, they form a ganglion (similar to the ganglion of Sir Astley Cooper), from which two principal branches proceed. The superior branch, shortly after it leaves the ganglion, gives off a small branch, which unites with the inferior branch of the fifth pair, and is distributed as we have de-

Another very remarkable fact that must strike every one who has opened the spinal column of the frog, and which has been particularly insisted on by Volkmann, is, that the combined volume of the cord greatly exceeds the combined volume of the nerves arising from it, which may lead to the conclusion, that the *medulla spinalis* is a central organ, and the seat of some important function; but this has been considered by those who support the excito-motory system, as equally favourable to their views, as they consider that some central organ is present to the development of that phenomenon, which they attribute to cineritious matter, or

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scribed. This superior branch then proceeds down to the larynx, and afterwards turns up and is distributed to the tongue. The inferior branch or division goes principally to the lungs and the heart, but in its course appears to give off a small branch to the larynx. The larynx is also supplied by the first, and a branch from the second spinal nerves. That the *par vagum* in the frog is a nerve both of sensation and motion, appears from the fact, that when both branches of the nerve are divided near their origin, the animal loses all sensation of the integuments of the throat, and in a great measure, the power over the movements of its lower jaw. The respiration also becomes laborious, and the eye is prominent and fixed as in a person labouring under great difficulty of breathing. I may here mention, that I by no means agree with the opinion of Volkmann, that, in the frog, the ganglion of the spinal nerve is divided between the two roots; for in the second spinal nerve, which is a nerve of considerable size, and corresponds to the brachial plexus of warm-blooded animals, the ganglion can be most distinctly observed to be placed on the posterior root, and the anterior root distinctly traced past the ganglion, before it unites with that branch. The same thing, I believe, I have observed in some of the lumbar nerves.

something analogous to it. But no cineritious matter has been found in the cord of frogs and reptiles. Nor has a distinct system of nerves been traced to a distinct portion of the cord in these animals, which shows that the doctrine of an excito-motory system is not founded on anatomical facts; and even in warm-blooded animals, in the cord of which cineritious matter does exist, it has not been established as yet, that one set of nerves is connected with the cineritious matter, and another with the medullary.

But as the truth of these particular views is to be established by the phenomena observed in animals subjected to experiment, or affected with disease, we shall describe the nature of the experiments which we have performed relative to this important subject, stating, *in limine*, the conclusions at which we have arrived, and which we conceive to be warranted by these experiments.

It appears that after removal of the cerebrum cold-blooded animals manifest distinct voluntary motion dependent on sensation.

Expt. 1.—The *medulla oblongata* of a frog was divided immediately behind the cerebrum, and the whole of the anterior portion of the brain removed, and the phenomena observed. Its respirations continued for some time, though diminished in frequency, and gradually ceased. No sensation appeared to remain in the integuments of its head, evidently arising from the injury the trigemina had sustained in the operation. The sensation and movements of the lower jaw were also impaired. But sensation appeared to be most acute on irritating the extremities and integuments of the other parts of its body, and voluntary motion remained perfect. For on irritating one of its toes, the foot and leg of that side were not merely retracted, but the frog immediately moved away and crawled about for some time. When it was seized with the forceps and retained, it struggled hard to be relieved, and on being freed bounded from the grasp. When an obstacle was placed before it a little higher than the surface of its body, so as to arrest its progress along the surface of the table, on being irritated, it could raise itself up, pass over it, and continue to move about for some time before it again sunk into a quiescent state, from which, however, it never moved without being irritated, showing that spontaneous motion or the power of originating motion in an animal is removed with the cerebrum, a doctrine which had been fully established by Flourens, as admitted by Cuvier in his report on M. Flourens's work.

I then placed this frog upon its back, allowing it to remain for a short time without being irritated, after which I took the forceps and gently compressed one of its toes,—when the reflex action became most distinct; for a slight movement was observed in all its extremities, which was repeatedly witnessed on irritation being applied to any of its toes. This, however, always required to be performed with caution, as a stronger irritation induced the frog to rise and move away. But it sufficiently proved that the reflex action was developed in a frog, whilst it was also enabled to perform distinct voluntary motion.

Expt. 2.—In a frog, the *medulla oblongata* was divided in a similar manner, and the whole of the anterior portion of the brain removed, and after allowing it to remain in a quiescent state for some time, irritation was applied and distinct voluntary motion produced.

On seizing its leg with the forceps it instantly withdrew it, and moved from the place on which it was sitting. The same thing was observed on irritating the integuments of its abdomen. When its cloaca was irritated, it moved its hind legs forcibly, and crawled to a distance, after which it drew up its legs, and placed them over its cloaca. On irritation being repeated, it continued to move away and change its position. But after subsiding into a quiescent state, it never moved without being irritated. Reflex action was most distinct in the movements of this frog. I touched one of its toes with a needle, when the most distinct reflex action was observed in all its extremities. I next touched one of its fore-legs, when it was not merely drawn up, but a universal movement was observed over its body, after which the frog raised itself up and changed its position. I placed it between two objects so that it was unable to move away, and on irritating the integuments of its back, it lifted up its hind-foot and passed it repeatedly across the part. I touched the toes of one of its fore-legs with the forceps, when it instantly removed it. I touched it again, when it drew it back and placed it below its abdomen. On removing the obstacle, I seized the integuments of its back with the forceps, when it withdrew itself, and moved to a short distance from where it was sitting.

Expt. 3.—In another frog in which the *medulla oblongata* was divided, and the brain completely removed, and in which feeble respirations remained and were continued at intervals, the reflex action was most distinct on irritating any of its extremities; for, on compressing slightly a toe of any of the fore-feet, the toes of the hind-feet were observed to move, and a general reflex action took place. This was repeatedly observed, so that no doubt could be entertained of the accuracy of the phenomenon. But what appeared interesting, and illustrates the fact that the nerves arising from the *medulla oblongata* take on the reflex action, as well as the nerves connected with the *medulla spinalis* is, that every time that I touched the toe of this frog, the muscles of the larynx were observed to move as well as those of the extremities, and at the same time a slight motion was observed in the eyes, depending on some of the fibres of the abducens and sixth pair, which arise from the *medulla oblongata*, remaining undivided. The power of progression remained, but was rather feeble. On irritating the extremities sharply, the frog raised itself up and changed its position.

When I touched the toes of its fore-foot, at the same time that the reflex action was observed, it raised up its foot and placed it below its thorax. When I irritated the integuments of its abdomen, it moved its body in the opposite direction, and drew up the hind-leg of the corresponding side and placed it on the part that was irritated. When I touched its cloaca with the point of a needle, it threw out its hind legs, and then drew them up and placed them over the part. When I touched it more sharply, it again threw out its hind-legs, and then crawled forwards a little. And when I irritated it on the dorsal region, immediately behind the division of the integuments, it excited distinct voluntary power, and crawled along the surface of the table.

Expt. 4.—I now took a young or half-grown frog, and removed the cerebrum with great care, leaving the nerves connected with the *medulla oblongata* as much as possible uninjured, and observed the phenomena. Respiration continued to be carried on freely. But, as in the other frogs, this had lost all spontaneous motion, and did not move from the position in which it was placed till irritated, though it was frequently observed to move its legs and draw them up; but on being irritated, moved with great vigour, and leapt about the table. The reflex action was also distinctly recognized. On compressing its toe gently with the forceps, that leg was not merely moved, but also all its extremities, and then it leapt from the place where it was sitting. This was frequently observed; but what was remarkable is, that every time this took place, the muscles of respiration were also moved, and at the same time the eyes drawn in and covered by the *membrana nictitans*, showing that the principal motor nerve of the eye took on the reflex action. When I touched the integuments of its back, it turned its body in the opposite direction, and lifted up its fore-foot and touched the part, and then its hind-foot in a similar manner; and when I touched it again, it leapt to a considerable distance.

These experiments, we conceive, afford undoubted proof of voluntary motion remaining in an animal deprived of its cerebrum, as, without this, it could not perform a continued progression, or move in the manner we have stated; for these movements differ in no respect from the voluntary movements of unmutilated animals, except in the circumstance of being alone excited by irritation; and if so, there must be sensation, or, philosophically speaking, perception,* for every successive movement implies that the impression of pain from the irritation remains, and excites the animal to action, and causes it to move from the source of injury, and if this were not the principle which regulated its movements, how could its muscles act in such unison, all to the accomplishment of an end,—the removal of the body from the place which it occupied,—and perception, we conceive, is also clearly evinced by the particular movements that are witnessed in an animal when, from weakness or restraint, such as being surrounded by objects, so that it is unable to perform progressive motion, but lifts its foot on being compressed, and places it below its body, or raises it up and moves it across the part of the integuments that is irritated; for these movements are evidently not formed at random, but with some fixed design. For of the various movements which an animal in this state is capable of performing, it always acts in a way the best adapted to the circumstances of the case, and shows that it is aware of the stimulus, and strives to avoid it. Hence it appears, 1*st*, that in cold-blooded animals at least, voluntary motion depending on sensation continues after the removal of the cerebrum, and this is one distinct proof that these functions can be performed by the nervous system independent of the cerebrum; 2*d*, These experiments, we conceive, also prove that when the reflex action is developed, it does not necessarily imply that the animal has no sensation or power of voluntary motion, for the latter were distinctly manifested when the former was developed, and it hence appears, that there is something more than, and perfectly distinct from, the movements of an excito-motory system in an animal deprived of its cerebrum.

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* "When I smell a rose," says Dr Reid in his Essays on the Powers of the Human Mind, "there is in this operation both sensation and perception. The agreeable odour I feel, considered by itself, without relation to any external object, is merely

The next question that demands our attention is, Do voluntary movements dependent on sensation obtain in cold-blooded animals after decapitation? in which condition it is well known the reflex

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sensation. It affects the mind in a certain way; and this affection of the mind may be conceived without a thought of the rose or any other object. This sensation can be nothing else than it is felt to be. Its very essence consists in being felt; and when it is not felt, it is not. There is no difference between the sensation and the feeling of it. They are one and the same thing. It is for this reason that we before observed, that in sensation there is no object distinct from that act of the mind by which it is felt; and this holds true with regard to all sensations.

" Let us next attend to the perception which we have in smelling a rose. Perception has always an external object; and the object of any perception in this case is that quality in the rose which I discern by the sense of smell, observing that the agreeable sensation is raised when the rose is near, and ceases when it is removed, I am led by my nature to conclude some quality to be in the rose which is the cause of this sensation. This quality in the rose is the object perceived, and that act of my mind by which I have the conviction and belief of this quality is what in this case I call perception.

" But it is here to be observed, that the sensation I feel, and the quality in the rose which I perceive, are both called by the same name. The smell of a rose is the name given to both; so that this name hath two meanings, and the distinguishing its different meanings removes all perplexity, and enables us to give clear and distinct answers to questions about which philosophers have held much dispute."—Essays on the Powers of the Human Mind, by Dr Reid, Vol. i. p. 344.

action is distinctly developed; and from the following experiments amongst a variety of others which we have performed on this important subject, we think we are warranted in advancing this proposition,

That voluntary motion excited by sensation is manifested by cold-blooded animals after decapitation.

This statement may appear to be bold, inasmuch as one remarkable circumstance has now taken place in animals in this condition, viz. that the animal has lost the power of progressive motion, and is unable to move about and change its place on being irritated. But if we take this into consideration, it will appear that the movements of cold-blooded animals after decapitation give distinct evidence of voluntary power and sensation; that the movements partake of a special and determinate character, and are evidently the same in kind though not in degree, with those which we have related above; whilst it is also acknowledged that the reflex action may be distinctly excited. These phenomena, however, have been more frequently viewed as a proof of the existence of sensation than of voluntary motion. But, as already stated, we do not consider that we have any proper criterion for determining the existence of sensation in animals except that of voluntary motion; since, if it be maintained that involuntary movements may take place with or without sensation, we can only properly determine that there is sensation when we have distinct evidence of voluntary power, and this evidence, we conceive, is afforded by the following experiments.

Expt. 1.—I divided the spinal cord of a frog immediately behind the skull, and passing an instrument into the brain completely removed it with the *medulla oblongata*, so that every portion of the central nervous system anterior to the division of the cord was completely abstracted. This mode of operation I preferred, because the animal being less mutilated survives longer, affording a more ample field for investigation. And having allowed the frog to remain quiescent for a short time till the effects of the operation had subsided, I irritated the extremities, when the movements of the frog appeared most evidently characteristic of design and adaptation; though a reflex movement could also be observed particularly in the opposite extremity. But no irritation caused the frog to perform progressive motion, as in the former experiments, so that a particular effect was produced by this division of the cord, viz. that the animal had lost the power of locomotion, and was unable to crawl about, and move from the place where it was sitting, as was the case with frogs when merely deprived of their cerebrum. I seized one of the toes of its fore-foot with the forceps, when it raised up its shoulder as if to withdraw its foot from the instrument. On seizing one of the toes of the other foot in a similar manner, it threw forward its body, and endeavoured to withdraw its foot, but, being retained, it planted the toes of the hind-foot on the point of the forceps, and threw its body in the opposite direction. Whilst lying in this position, I pinched the fore-foot of that side with the forceps, and it immediately drew it in, and, turning itself upon its face, placed its foot below its thorax. On irritating its cloaca slightly, it drew up its legs and placed them over the part. On the irritation being applied a little below the cloaca, it drew up its feet and placed them over the part.

Expt. 2.—We divided the spine of a frog immediately behind the skull, and removed every portion of mucous matter anterior to the division of the cord; and having allowed the frog to remain at rest for a short time, applied irritation and observed the phenomena. When I touched the toe of its hind-foot with the forceps, the animal withdrew the limb, and placed it below its abdomen, at the same time a slight movement was observed in the toes of the opposite extremity. When I irritated the integuments of its back with the point of a needle, it raised one of its hind-legs and passed its foot across the part that was irritated, at which time a slight movement was observed in all its extremities, and then the frog raised itself up and made an effort to move forwards. On some occasions this movement of its extremities could scarcely be perceived when it raised up its foot and touched the part of the shoulder that was irritated. Again, when I seized the integuments of its abdomen with the forceps, it raised itself up as if to withdraw the part, but being retained it raised both the fore and hind leg of that side, and placed them over the part that was irritated. On laying it upon its back, and irritating the integuments of its thorax with the point of a needle, the most distinct reflex action was excited in both its anterior extremities. And on irritating the integuments around the cloaca, distinct reflex action was produced in all its extremities; and a more severe irritation was accompanied with an effort of the frog to raise itself up.

Expt. 3.—In another frog the spinal cord was divided immediately behind the skull, and the brain, &c. removed in a similar manner. After the exhaustion subsequent to the operation had subsided, this frog was observed to draw up one of its hind-legs of its own accord. I touched its fore-leg with a needle, when it immediately drew it back and placed it below its abdomen. On irritating its axilla it drew its arm into close contact with its body. But the irritation being still persisted in, it raised its body violently up and threw itself upon its back. After being again placed upon its face, I irritated the side of its abdomen, when it brought both the fore and hind leg of that side into closer contact with its body, and, on being irritated more severely, it moved forward its hind-leg repeatedly to the part that was irritated. I seized the integuments of its back, when it bounded forwards, and having irritated its hind-foot, it raised it up, and placed it below its fore-leg, which was at the time lying alongst its side, and having seized the integuments of its thorax with the forceps, it raised up its shoulder as if to withdraw the part, but, being retained, it moved forwards the toes of its hind-feet repeatedly to the part.

Expt. 4.—The spinal cord of a frog was divided immediately over the origin of the brachial plexus, which in the frog is the second pair of spinal nerves, and the anterior portion of the cord with the brain removed as formerly; and after a short time, irritation was applied, and it was observed that a slight movement could only be produced in the anterior extremities, on account of the injury inflicted by the operation on that part of the cord from which the nerves arise. But on touching its hind-foot with a needle, it immediately withdrew it from the source of irritation. On irritating the groin, it drew the thigh into closer contact with its body. On seizing the integuments of the side of its abdomen with the forceps, it threw out the hind-leg of that side, and scratched the part with its foot. On irritating the integuments of its abdomen on the opposite side of the body, it threw forward its hind-foot forcibly to the part, drawing its body in the opposite direction. I then seized the upper part of the dorsal region on the right side with the forceps, and it actually raised its hind-leg, and passed its toes along the part. I again irritated the same part, and it raised up its foot in a similar manner. I next irritated the left dorsal region, and it raised up its left leg in a similar way, and passed its foot over the part that was irritated.

These experiments, we conceive, warrant the conclusion, that the movements of cold-blooded animals after decapitation, are characteristic of design and adaptation; and that though there exists in animals in this state, a great tendency of the impression conveyed to the medulla to be extended over the body and extremities, yet that, independent of all this, there is a distinct voluntary movement exerted by the animal itself, and evidently dependent on sensation. When an animal, after losing the power of locomotion, moves its foot on being irritated with a needle, and places it below its thorax or abdomen, or raises it up and passes it repeatedly across the part of the integuments that is irritated, or moves its body according to the degree and mode of irritation, we cannot but conclude that it exerts a determinating power over its movements, and that they result from a painful irritation which it feels proceeding from the source of irritation. For such special and determinate movements, be it observed, require a particular action of the limb and muscles, which is a distinct evidence of voluntary power. Because if no volition was exerted by the animal in these cases, why should one limb be raised up in this manner in preference to every other, to the part that we touch with the needle ; or why should the hind-foot be moved forwards to the identical spot in the dorsal region that is irritated ? movements perfectly similar to what we observe in other animals when a particular part of their body is irritated. And as we never find an animal constituted with the power of voluntary motion, without at the same time being possessed of sensation, when in decapitated animals we find an evidence of voluntary power exerted on irritation of the integuments, we naturally conclude that it is dependent on a sensation to which the irritation gives rise, so that it appears that an animal in this condition is possessed both of sensation and voluntary motion.

But this view of the subject may perhaps be objected to by some physiologists, on the ground, that, as we have distinct evidence of design and of adaptation of means to ends in many of the reflex movements of the body, such as contraction of the iris, the associated movements of sneezing, coughing, defecation, &c., it is not proper to consider the adaptation of means to ends, and the evidence of design that is manifested in the movements of a decapitated frog, when it lifts its foot to scratch off any cause of irritation from its back, &c. a sufficient evidence of voluntary power. But there appears to us to be a great and manifest distinction between the two cases. In the contraction of the iris, and the associated movements of sneezing, coughing, defecation, &c. we have an adaptation in the structure of the parts to the particular function which they perform, or an evidence of design in the Author of Nature endowing these parts with the property of contracting, on the application of a particular stimulus, just as we observe in the contraction of the heart, &c. But these movements afford no evidence of the adaptation being the design of the animal, as they are merely a uniform sequence or contraction of the parts from a particular irritation—every successive movement being a repetition of the former, and performed without change or variation ; and hence cannot be considered a proof of voluntary power. On the contrary, when an animal lifts it foot to scratch off any cause of irritation from its back, &c. it does not result from any particular structure of the parts to that particular end, as that is only one of a multitude of movements which it might have performed ; and hence the evidence which it affords is that of being a voluntary act, or of design on the part of the animal, and this has universally been considered the data by which we determine a movement to be voluntary in an unmutilated animal. When we therefore observe a decapitated animal lift its foot in a similar manner, and scratch the part that is irritated, am I not bound to conclude that we have here as distinct evidence of voluntary power as in the former case, and that the movements are identically the same? For if this be not considered a voluntary movement, we must deny the data by which we determine a movement to be voluntary, as it undoubtedly bears all the characteristics of those movements that are otherwise considered as such; and we, moreover, admit that, in a decapitated animal, a definite end is accomplished by indefinite means, which certainly appears to be very remarkable.

It will be observed, that in what we have stated concerning the powers possessed by cold-blooded animals after decapitation, we have viewed the question respecting the whole of the cord, and not of a separate section, as our object was principally to ascertain the functions of the spinal cord as illustrative or not of the truth of an excito-motory system. But we may remark, that this power seems to be possessed by a considerable portion of the cord; and from Expt. 4 we perceive how distinctly that phenomenon was developed by the entire portion of the cord below the brachial plexus, as the part connected with that was so much injured, that only a slight movement could be produced in the anterior extremities. The same thing I have repeatedly witnessed on a similar division of the cord, and on a section being made between the fourth and fifth spinal vertebræ, similar phenomena continue to be manifested, though with less vigour; for on irritating the integuments of a frog immediately below that division of the cord, it would raise up its leg and scratch the part with its foot, at the same time the reflex action was more readily excited in both extremities, and a longer period required to elapse before the movement could be repeated. But in the lowest portion of the cord, the nervous energy becomes so weakened and impaired, that, on a section being made about the origin of the four last pair of nerves, we could seldom excite any but a few spasmodic movements of the muscles on applying irritation to the extremities.

And these movements, partaking of such characteristics, differ, we conceive, essentially from that class of movements that are strictly termed the reflex action, and take place independent of sensation and volition; for an important element enters into the former that is not to be found in the latter, which is, the evidence of the recognition of an external impression, or of the source of irritation, which, wherever it is observed, is a distinct evidence of voluntary power, but which is not to be found in those cases that have been recorded as illustrative of the doctrine of a reflex action. This is illustrated by the circumstances of the following cases.

1. In a case recorded by Dr M. Hall of a person whose spinal marrow had been injured by a fall from a tree; the lower half of his body and inferior extremities were entirely devoid of sensation, and they were not in the slightest degree under the influence of the will. Sometimes the patient had cold shiverings, and while the muscles of that part of the body supplied with nervous ener-

gy from above the seat of injury were observed to shake, those deriving their nerves from below that spot were perfectly motionless, notwithstanding the anaisthesia, and the patient's inability to effect a single movement through the medium of volition. When the integuments of the legs were pinched, or more particularly when the sole of the foot was tickled, the extremities were retracted with considerable force. A little cold water dashed upon the surface produced the same effect, though there was no feeling of coldness. One leg was constantly in the flexed position, and if straightened, immediately recovered it again." Hall's Memoirs, pp. 63-64.

2. In the case of a girl affected with Pott's disease of the vertebræ ; on pricking, scratching, or pinching the skin of the left foot, indications of sensation of pain occurred, and the girl asserts that she feels pain, at the same time, irregular movements of the toes of the left foot and left leg follow, over which she has no control. But on irritating the integuments of the right foot in a similar manner, there is not, even when blood is drawn, the slightest indication of pain, and the girl asserts that she feels none, and irregular muscular movements of the right toes, leg, and thigh are produced. These movements are sometimes those of flexion, sometimes those of extension, and are not those produced on withdrawal of the limb, or such as would appear the natural result of sensation of pain in the part affected."—(Lancet, April 14, 1838.)

3. In the case of a woman, aged 33 years, recently attacked with hemiplegia,—" Complete loss of sensation and motion in the left upper and lower extremity, in whom, nevertheless, pinching, or even slightly touching the sole of the foot or ankle of the paralyzed leg, causes the limb to be retracted and the toes extended, the patient being unconscious both of the stimulus and of the movement. The phenomenon is here the more striking, as in the opposite leg, which possesses its full voluntary power, no spasmodic contraction is produced, although the slightest touch is felt."—(Note annexed to Muller's Physiology, by Dr Baly, Vol. i. p. 721.)

4. In the phenomenon of the reflex action in a rabbit, after division of the spinal cord.—In an experiment performed by Mr Mayo on a rabbit, we are informed, "upon dividing the cord, and pinching the under part of the foot, a most violent motion was excited, and both legs were thrown back. Those gentlemen who were present were particularly struck with the difference of the movements in this rabbit before and after the division of the spinal cord. I found in this and other similar experiments, that when the thin skin of the leg was touched after the section of the cord, a very slight contraction was produced ; and that it was only when the under part of the foot, which in progression strikes on the ground, was irritated, that the remarkable and combined action of both legs was produced." (Granger, p. 54).

In all these cases, it was a general or spasmodic movement that was produced, affording no evidence of design or of adaptation of means to ends, and equally destitute of sensation and voluntary motion, as the movements produced by galvanism in the extremities of an animal recently deprived of life. But, in the case of cold-blooded animals, we recognize special and determinate movements, which indicate power and design on the part of the animal, as they are varied according to the mode of irritation, &c.

We, therefore, readily admit, that these movements to which we have adverted are distinctly reflex, being destitute of sensation and voluntary motion, and depending on the impression conveyed to the medulla by the afferent nerve being reflected or conveyed back by the efferent nerve, and that this is all that is necessary to constitute a reflex movement. But that it may also take place in connection with sensation, as in sneezing, coughing, defecation, closure of the eyelids, on a strong light being presented to the eyes, &c., and when an impression is suddenly and unexpectedly produced upon the body, which is always more developed, if there be any irritability of the nervous system. But I am decidedly of opinion, that this phenomenon does not depend on a distinct system of nerves, on an excito-motory system; and that it cannot be laid down as a general principle, that we have one set of nerves connected with the *medulla spinalis*, and another with the cerebrum, which alone is the source of sensation and voluntary motion; for, in cold-blooded animals, after decapitation, as we have seen, there may be a great tendency of the reflex action to be produced and extended over the system, yet the movements that we witness indicative of design and adaptation of means to ends, sufficiently prove that sensation and voluntary motion remain in an animal in this state.

And we conclude from the phenomena observed in these experiments, that the upper portion of the spinal cord of cold-blooded animals is endowed with the power of sensation and voluntary motion; and that, when this portion remains entire in a decapitated animal, after removal of the *medulla oblongata*, the animal is alive to the stimulus applied to its body, and performs movements in accordance with its nature and degree, or indicative of design and adaptation of means to ends.

ART. VI.—*Cases of Extra-Uterine Conception.*

1. *Case of Extra-Uterine Conception*, by THOMAS WILLIAMSON, M.D. Edinburgh, one of the Physicians to the Leith Dispensary, &c. &c.

EXTRA-UTERINE conception in the human female is of so comparative rare occurrence, as to invest such cases with much interest in a physiological point of view; and more especially that there are sometimes comprehended in connection with these, doctrinal points, neither easy of satisfactory explanation, or altogether compatible with the acknowledged physiological views of ordinary uterine conception.

I regret that I cannot give a more full and detailed account of the following case of tubal conception, which recently came under my observation, seeing that during life, at least, no suspicion existed in my mind of the real nature of the case, which consequently prevented me from watching and observing, so narrowly as I could otherwise have wished, the daily history of my patient's symptoms during the few months which intervened between the period of my first visiting her and subsequent death.

The patient was a young woman, about 27 years of age, who had previously born two healthy children at the full time, the latter of whom was born about two years previous to her last fatal impregnation. Up to within six months of her death she had enjoyed good health. About five months previous to the fatal termination of her conception, I saw her for the first time, and found her labouring under all the ordinary symptoms of an attack of ileus. She had been suddenly seized with acute abdominal pain, referable to the epigastric region, accompanied with stercoraceous vomiting; obstinate constipation of the bowels; and great prostration of strength. My friend, Dr Combe, at this time saw the patient with me, and, under the use of enemata and other appropriate remedies, in the course of a few days, she apparently recovered.

Subsequent to this, however, she experienced two or three other attacks of a similar character to the first, although much less severe in point of intensity. These occurred within three months of my first seeing the patient, and readily yielded to treatment.

For about the space of two months and a-half, I heard no more of this case, till one day her father called upon me, and stated that his daughter had died that morning in Edinburgh, after less than half-an-hour's illness, and requested me to examine the body, which I willingly agreed to do.

The most satisfactory account which I was enabled to obtain relative to her latter symptoms was from neighbours who had seen her shortly before death, and was to the effect that whilst in bed she had been suddenly seized with severe abdominal pains, and rapid sinking.

I ought also to mention, that the patient's mother met me one day shortly before her daughter's death, and in answer to inquiry after the state of the patient's health, informed me that she was now quite well, and, judging by the last menstrual period, concluded herself seven months advanced in pregnancy; and, moreover, that she somehow or other attributed all the symptoms under which she laboured, when first seen by Dr Combe and myself, to conception having at that time taken place. This latter hint, coupled with the subsequent fatal symptoms, induced me to hazard to a friend the possibility of the case being one of extra-uterine conception, which the result of the examination fully confirmed.

Dissection.—The external abdomen was much swollen, and slightly tympanitic. Upon cutting into and reflecting the abdominal parietes, a large solid coagulum of blood, about three and a-half pounds in weight, was observed completely covering the viscera, insinuating itself between their convolutions, and extending about half way up the *omentum majus*. Upon removing the solid coagulum, a fœtus seemingly about the sixth month was brought into view along with three additional pounds of fluid blood, which latter were contained in the abdominal cavity. The back of the fœtus was towards the abdominal parietes of the mother; its legs were bent upon its trunk, and the arms crossed on the chest. The anterior fontanelle was in apposition with the symphysis of the pubis, and the buttocks in a direction a little to the right of the umbilicus of the mother. Upon tracing the cord downwards, I arrived at the placenta, which was found strongly adherent to the bottom of a membranous-looking bag, quite external to the uterus. A portion of the placenta had been separated, which might perhaps in part account for this very large hemorrhage. This same sac or bag had contracted very powerful adhesion to a portion of the *intestinum ileum*. The vermiform appendix also of the cæcum had become adherent to the wall of the sac, and, by passing across a portion of the ileum in the form of a band or bridge, thus very satisfactorily accounted for the repeated attacks of ileus under which the patient during life laboured. The sac in which the placenta was contained was fairly rent across. The uterus was perfectly entire, and extremely large from pure sympathy. Its length from the middle of its fundus to the edge of the anterior lip of its os, was four and a-half inches; its breadth between Fallopian tubes, was three and a-half inches; its thickness, three-quarters of an inch. When laid open, it presented to all appearance a decidual lining, and its os was filled with the usual gelatinous plug. The left Fallopian tube was pervious. The corresponding ovary when cut into exhibited no evidence of a *corpus luteum*. The right ovary could only be felt, being completely matted or imbedded in the external general mass of adhesion, but from the feel it evidently contained the *corpus luteum*. Upon passing a probe along the right Fallopian tube, from the uterus, it made its appearance through the placenta within the sac, evidently proving that this sac or bag, was neither more nor less than the right Fallopian tube, which had burst in a state of extreme distension.

Such is a brief history of the case, which, besides other interesting facts connected with it, appears to me to be very remarkable, from the lengthened period which the fœtus was permitted to remain within the Fallopian tube. It is also somewhat singular, that no trace of the ordinary membranous envelopes of the fœtus was found surrounding it, although, at the same time, careful examination enabled us to detect their remains covering the fœtal surface of the placenta.

2. *Case of Extra-Uterine Conception*, by THOMAS BOSWALL WATSON, M. D.

Mrs G., aged 27, was attacked, on the afternoon of 14th December, with vomiting and pain of the abdomen, particularly in the hypogastric region. The pulse small and weak; she felt very faint, but after some time rallied considerably under the administration of stimulants. She, however, became rapidly worse in the course of the evening, and died at 9 P. M.

Examination of the body thirty-six hours after death by Dr Paterson of Leith and myself.

Abdomen contained between two and three pounds of fluid blood, and one and a-half or two pounds of solid coagulum, on removing which the following facts were observed.

The uterine organs were observed to be somewhat larger than in the unimpregnated state; the uterus itself about double in point of size; the *os uteri* congested; the walls when cut into were thick; the cavity of the uterus was lined by a membrane of a vermilion colour, and coated with a gelatiniform substance, as was also the *cervix uteri.*

The right ovary, when cut into, presented numerous large vesicles, and several small yellow points.

The left ovary was about double the size of the right, and presented a beautiful specimen of a recent *corpus luteum*, with broad yellow striated margin and central cavity, distinctly lined by a membrane; the substance of this ovary was much more vascular than that of the right.

The left Fallopian tube presented a dilated portion about two inches in length, and one inch in breadth, close to its uterine extremity, of a dark purple colour, and presenting superiorly a ruptured portion, from which a small coagulum protruded.

The walls of the tumour were semitransparent at the posterior part, through which a small fœtus (about the size of a horse-bean) could be distinctly seen floating in the contained fluid.

Upon slitting open the tumour the membranes of the fœtus were brought into view, partially attached to the coagulum, which protruded from the ruptured orifice, and adherent by bands of chorion to the sac throughout.

The eyes of the fœtus were distinctly visible, appearing as minute points, the extremities just budding.

The Fallopian tube was impervious at its uterine extremity, bu pervious till within about half an inch of the tumour at its ovarian extremity.

ART. VII.—*Enlargement of the Thyroid body, with a collection of fluid in its substance, and its analysis.* By Mr J. MASSEY, Surgeon, Nottingham.

Mrs MATHEWS, aged 36 years, the mother of five children, has enjoyed tolerably good health till within the last twelve months; has an enlargement of the thyroid body, which has existed ten years. Its increase has been gradual, and not attended with pain. Of late it has become of such magnitude as to cause great inconvenience, more particularly during the last three or four months.

Feb. 16, 1841.—Her complexion is sallow; she complains of nausea, headach, vertigo; and there is general turgescence of the vessels of the head; the bowels for the last twelve months have been very costive; evacuations scybalous, with flatulency and irregular pains over the abdominal region; dyspnœa accompanied with wheezing, hoarseness, and a sensation of choking, much increased by stooping and unusual exertion; the throat is dry and husky, producing a tickling cough; she feels as if a cord were tied round her neck, and a heavy weight placed behind and between the shoulders; she complains also of a numbness of the hands and fingers, which is not the case with the lower extremities; she has palpitation with pain over the right hepatic region; has never had jaundice, although there is now a very slight yellowness of the conjunctivæ.

Both lobes of the thyroid body are considerably enlarged; on the right side it extends inferiorly to the clavicle, superiorly to the upper border of the thyroid cartilage, and posteriorly behind the posterior border to the sterno-mastoid muscle; on the left side the disease is much less extensive; the connecting portion or isthmus is tense, elastic, and very prominent in front of the trachea, separated from the lateral portions by a groove, giving the whole the appearance of three lobes of different sizes and character; the right lobe had a distinct lobulated feel, the left being more of its natural structure; whilst the third or central portion had a uniform globular surface about the size of an orange with an evident sense of fluctuation; the lateral portions descending on each side of the windpipe formed with the transverse portion above a kind of archway, in the centre of which the rings of the trachea could be readily felt.

Feb. 20.—I introduced the exploration needle into the superior or central portion, and evacuated two ounces of fluid of a deep-brown colour, having crystalline particles floating in it. This portion of the tumour was by this means reduced almost to its natural size.

I forwarded the fluid to my friend Dr Wright, now Physician to the Dispensary, Birmingham, who kindly favoured me with the following analysis of it :—

Slightly alkaline, but containing no ammonia. Specific gravity, 1.0386. Composition,

Water,		823.640
Colouring matter,		67.250
Albumen,		59.600
Cholesterine,		19.870
Oily matter,		5.190
Gelatine,		8.320
Salts,	chlorides phosphates sulphates carbonates — lime and soda	11.950 4.180
Loss,		1000.000

She was directed to rub in freely *Ung. Potassæ Hyd.*, and take twenty drops of the solution of iodine three times a day.

Feb. 26.—Since the evacuation of the fluid, the enlargement has assumed a totally different appearance, the two lateral portions having approximated to each other from one tumour in front of the trachea; the central portion has entirely disappeared; the whole mass, diminished to not more than one-half its original size, is more firm to the touch, not painful, and has no sense of fluctuation; the breathing is more free, and her general health ameliorated. *Contin. Med.*

March 2.—Much as before; tumour gradually diminished. *Cont. Med.*

April 20.—Bowels continue costive, and she has suffered from febrile symptoms for the last week.

℞ *Mist. Mind.* ℥iss. *4ter horis.* ℞ *Pil. Rhei Co.* gr. x. *o. u.*

The tumour is now about the size of a hen's egg.

May. 2.—Has been unable to attend since last report, having had a severe attack of fever. The febrifuge remedies were continued during that period.

May 18.—Have introduced a seton of silk, and directed a poultice to be applied over it.—*Capt. Pulv. Rhei Co.* ℨi. *2a quaque mane p.r.n.* *Cont. Mist. Mind.*

May 30.—Seton removed; it has discharged a serous fluid partaking of the same nature as was evacuated by the needle. She thinks the tumour is about one-third less than before its introduction; complains of general debility and palpitation; the bowels are now daily relieved.—*Hirudines* vi. *bis in septimana; Pil. Rhei Co.* gr. x. *o. u.*

℞ *Potassæ Hyd.* ʒi. *Sig. Potassæ.* ʒii.; *Infus. Gent. Co*
℥viii. M. ℥i. *ter die.*

June 22.—Since last report she has continued the treatmen prescribed with considerable advantage; her appetite is better; her general health is much improved; bowels continue to be regularly relieved by a mild aperient. There is a discharge of sero-purulent matter from an opening left by the seton. This has been analysed also by Dr W. and does not contain cholesterine. The complexion is less sallow, and the conjunctiva free from any bilious tinge. The tumour has very considerably diminished, is not at all painful. *Utatur bis in die Ungt. Hyd. fort. Cont. Mist. Gent. Co. c. Potassæ Hyd.*

28.—The wound is now healed, and the tumour diminished to the size of a small pigeon's egg.

Nov. 25.—Since last report I have not seen the patient, as she lives in the country, but have been informed of her death, which was caused by a disease totally different to that I have reported.

The above case is very interesting, not only in showing the abnormal secretion of this body, but also from its separating with the other fluid so large a quantity of cholesterine; also the very torpid state of the bowels before the fluid was evacuated from the cyst; and a considerable reduction in the volume of the tumour had been effected by the remedies; and from their altered condition in this respect subsequently, viz. Feb. 16, May 30, and June 22d. Another remarkable fact is, the change which took place in the situation of the tumour after the use of the exploration needle.

The difference of the appearance and character of the enlargement observed in the three portions of this body illustrate very clearly its pathological condition and development. On the right side, the lobular structure was large, and the cells throughout its entire extent appeared to be distended with fluid, although not in that quantity necessary to rupture many, if any of them. On the left side, the lobular structure was much smaller, and approximated more to its natural state, whereas in the central portion, the secretion had accumulated in so large a quantity as completely to rupture the cells, and convert the whole of this portion into a cyst from which the fluid was evacuated.

The questions suggesting themselves are, *firstly*, Whether the disease called bronchocele does not primarily consist in an enlargement of the thyroid body, produced by an increase of the natural secretions into the cells of one or more portions of its lobular structure, as the exciting or predisposing cause shall have greater or less influence; and *secondly*, Whether this fluid does not become altered in character as the vitiated condition of the circulating system may eventually determine.

I have, at the present time, a number of cases of a similar nature under my care, which will enable me, I think, satisfactorily to dispose of the above questions.

ART. VIII.—*Remarkable Case of Suicide from Asphyxia by Choking, from the introduction of a firm Plug into the Fauces.* By P. D. HANDYSIDE, M. D., F. R. S. E., Lecturer on Surgery, and one of the Acting Surgeons to the Royal Infirmary. (Read before the Medico-Chirurgical Society in February 1838.)

THE subject of the following case, Mary Anne Palmer, aged 29 years, was found dead on the 27th December 1837, in the sleeping apartment which she occupied, being previously in a state of robust health. In accordance with the provisions of the Anatomy Act, her body was received by me for public dissection on the 29th December.

The cavities of the head, chest, and abdomen had been already examined, and in the medical certificate which accompanied the body, the deceased is stated to have died of apoplexy.

When the body was brought into my practical anatomy rooms, I carefully examined it anew, with the aid of Dr Mercer, Lecturer on Anatomy and Physiology, then my demonstrator; and we attended especially to the state of the cavity of the skull, and to the appearances on the encephalon and its membranes, which had been previously divided freely.

Nothing, however, that then came under our observation appeared to be in any degree adequate to account for death. Accordingly, I entered a note to that effect in the record of subjects. I did not inquire farther into the facts of the case at that time, (conceiving that the deceased had died of simple apoplexy), but had the lips sewed together to prevent rapid decomposition, as I purposed to reserve this subject for my lectures.

Having had occasion, on the 24th of January following, to demonstrate the muscular structure of the pharynx, I introduced my finger for this purpose into the back part of the mouth, in order to stuff that cavity with hair; but this space I found to be preoccupied by a dense foreign substance, apparently round in form, and impacted between the root of the tongue and the soft palate, so very firmly, as to have cut off the supply of air to the lungs during life by forcibly closing the mouth, and posterior nares.

This extraneous body I was wholly unable to dislodge without previously introducing my finger from below and behind through the upper part of the œsophagus, where I found, applied closely to the opening of the glottis, the apex of a firm conical plug, somewhat curved, of 3½ inches in length, 1⅝ of an inch in breadth at its base, and three-fourths of an inch in breadth at its apex. I took a cast of the plug, and have deposited it in the Royal College of Surgeons' Museum; while a drawing of it *in situ*, taken by my former pupil, Mr Willington, Surgeon in Warwick, is given in Plate VII.

The materials of this plug, now in my museum, and which were unrolled by the procurator-fiscal, consist of portions of soft cotton, called spindle ends. These were recognized by the parties interested, as having been used by the deceased in the solitary employment which she pursued at the time of her death. Some of this cotton she had untwisted and rolled up very closely, coiling over it two strips of flannel, which she had borrowed the last time she was seen in life. Finally, she had fastened these materials tightly together by means of a large rough pin.

On minutely examining the interior of the mouth, the soft palate presented to view, on the left side of the uvula (a part which corresponded with that portion of the plug where the rough head of the pin projected) a small though deep laceration of the texture, and which, notwithstanding the long interval of time that had elapsed since death, was surrounded by a circumscribed patch of ecchymosis, that remained still of a bright vermilion hue. The right side of the soft palate presented a similar ecchymosed spot, without any accompanying laceration, however. The surfaces of the anterior fourth of the tongue and the hard palate opposite to it,—parts which had been compressed by the broad and round base of the plug,—exhibited each a transverse band of ecchymosis, but these were paler in colour than the former patches. Lastly, the epiglottis and arytenoid cartilages, which appeared to have been violently separated by the last expiration, and were retained apart by the narrow and rough extremity of the plug, exhibited diffused ecchymoses, as evidenced by the traces of coagulated blood that on dissection were displayed underneath the mucous membrane investing the larynx. For these appearances see the drawing.

I communicated the observation now made to the procurator-fiscal, offering it as my opinion that this plug had been introduced during life, and that its presence in the situation described seemed quite sufficient in itself to produce immediate death.

The result of the various legal inquiries thereafter instituted by authority, led to the conclusion that the deceased committed suicide.

Having been repeatedly urged to publish this case as interesting in a medico-legal point of view, I do not longer withhold it. It appears to me to be interesting from the following considerations,

1. The length of time that the appearance of recent ecchymosis lasted. This condition of the ruptured vessels was preserved, independently, perhaps, of the solution of nitre (consisting of one ounce of this salt to a pound of water) introduced, along with the other ordinary injection materials, into the arteries of the body.

2. The practical importance and necessity that there is of inspecting minutely the body in cases of sudden death, where any difficulty occurs in accounting for it; and the more especially so in cases, resembling that under consideration, where a *medico-legal* examination has been ordered. We must not rest satisfied with the careful inspection of the outer surface of the body, and the dissection of its greater cavities, but ought also narrowly to examine the condition of the natural apertures of the body.*

I may here present in one view what appear to be the parts of the body proper to be examined, and the apparatus available in many Ordinary and Medico-legal necroscopic inspections.

I. *Ordinary Inspection.*—The head, spine, thorax, and abdomen; the arteries, veins, and absorbents.

II. *Medico-legal Inspection.*—Wounds, bruises, ecchymosis, livor or sugillation, rigidity; the eyelids, ears, nostrils, mouth, fauces, pharynx, larynx, œsophagus, rectum, urethra, vagina, uterus; besides the parts enumerated under the former head.

III. *Apparatus.*—Scalpel, bone-pliers, saw, chisel, mallet, curved probed bistoury, dissecting forceps, basin, pail, oiled-silk, large scissors, bees' wax, probe, foot-rule, ounce measure, sponge, lard, blow-pipe, funnel, water-caraffe, test papers, test tubes, lens, needle, twine.

3. As a precaution to medical men in furnishing reports of the appearances observed at medico-legal inspections in cases of Suffocation, and that they may not then be thrown off their guard, it is to be remembered, that in every case of death by Choking, Smothering, or Strangulation the natural appearances of the body are not necessarily altered. Accordingly, in the present instance, the surface and the great cavities of the body appeared to be perfectly healthy in their structure and contents. Such a medical report, then, as that furnished in the present case would manifestly be justifiable only after the pharynx and the other apertures of the body had, in addition to the usual parts, been examined, and after no cause of death, such as here presented itself, had been detected. After *such* an inspection only might apoplexy be reasonably concluded to be the cause of death; and this inference may be drawn, notwithstanding the absence of the usual morbid phenomena of apoplexy, since death may be caused, as is well-known, by the simple apoplexy of Abercrombie,† or the idiopathic asphyxia of

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* Some interesting observations, by Mr Skae, on *accidental* death by suffocation, may be found in the Ed. Med. and Surg. Journ. liv. 149.

† Edin. Med. and Surg. Jour. xxxi. 242.

Chevalier,[*] without the body presenting any morbid appearance whatever.

The only case which appears on record of a similar nature to that now narrated, is one equally remarkable with the above. It is described by Professor Wagner as having occurred in Berlin in the year 1833.[†] "A criminal who had been shut up alone in a dark dungeon, when visited by his keeper not long after, was found lying dead on the floor. It was thought at first that he had had a fit of apoplexy. A vein was opened, and other means of recovering him were tried, but to no purpose. It was now for the first time noticed that he had a foreign body in his mouth; and upon examination, it proved to be a piece of woollen cloth two ells long and a quarter broad—a shawl, in fact,—which the wretched man had thrust into his throat. Had this person been found dead under other circumstances, what reason would there not have been for suspecting that he had been murdered by a strange hand?"

I heard about five years ago of a similar case of suicide having then occurred in this city. A man accomplished his death by Choking, having forcibly introduced his handkerchief into the fauces.

Edinburgh, 24, Duke Street.

ART. IX.—*Antiquarian Notices of Leprosy and Leper Hospitals in Scotland and England.* Part III. The Etiological History of the Disease. By JAMES Y. SIMPSON, M. D., Professor of Midwifery in the University of Edinburgh.

[Concluded from No. 150, p. 156.]

To conclude the present hurried sketch of the British Leprosy of the middle ages, it now only remains for me to consider, in relation to the etiology or causation of the disease, the Rank, Age, Sex, &c. of those that were attacked by it; the effects of its hereditary transmission; and the question of its propagation by contagion. In connection with this last subject, I shall attempt to bring together under one view the stringent regulations and usages that were adopted by our ancestors with a view of preventing the diffusion of the disease by means of communication between the infected and the healthy; and at the same time consider the light in which the despised lepers were regarded both by the civil and ecclesiastical law.

RANK OF THE PERSONS ATTACKED BY LEPROSY.

In this country the leprosy of the middle ages seems to have had its largest share of victims in the lower classes of society,

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[*] Lond. Med. Chir. Trans. i. 157.

[†] See the Lond. Med. Gaz. for March 29, 1834.

—amongst the "villeyns" or bondsmen of these times, and the poorer peasantry and burgesses, who, when shut up in the hospitals, were obliged either to depend upon the funds of these institutions, or to beg for their support. The exact trade and calling of the individuals admitted into the Scottish and English hospitals can only be very imperfectly gathered from one or two casual notices.*

Among the patients of Kingcase leper hospital in Ayrshire, I have only found one whose rank I can trace. In the burgh of Prestwick† records for 1478–9, Anne Kerd is formally accused before the magistrates of the burgh of visiting Kingcase, and further "hir seik soun, at is lepper, repairis daili in her house [in Prestwick."] This Anne Kerd having "a sick son that is leprous" seems from the old "*Liber Communitatis, &c. de Prestwick*" of 1470 to have had assigned her a very small fragment of the burgh lands only, viz. "a porciunkle of commoun lande quilk acht after hir lyve to John Haveris airis (which belonged after her life [death] to John Haveris' heirs.")‡

Amongst the citizens of Glasgow who were at different times, in the latter part of the 16th century, ordered by the magistrates to be visited, under the suspicion of labouring under leprosy, most are recorded by their mere Christian name and surname; but two or three are entered in the burgh records in such terms as to show their occupation and probable rank, as, "Robert ——, fleschor," in 1573; "Mr James ——, fleschor," "Patrick Bogle, maltman," and "Andro Lawson, merchand," in 1581.§ One of these individuals is reported by the Water Bailies as confined in the Glasgow Leper Hospital at the Brigend‖ in 1589, along with five other lepers. The whole list is interesting for our present purpose, as showing the trade and calling of the infected inmates, viz. "Andro Lawson, *merchand;* Stevin Gilmor, *cordener;* Robert Bogill, sone to Patrick Bogle; Patrick Birstall, *tailzeour;* Johne Thomsoun, sone to Johne Thomsoune, *tailzeour*; Daniel Cunninghame, *tinclar*."

I am not aware of the existence of any similar complete list of the inmates of other British leper-hospitals, to which I could refer with the view of ascertaining the occupation and rank of those that occupied them. We have scattered records, however, to show, that men of riches occasionally became the victims of the disease, and passed their subsequent term of life in the leper hospitals. Thus, Jenkins, in speaking of the St Mary Magdalen lazar-house at Exeter, states, "Richard Orange, Esq. a gentleman of noble parentage, and mayor of this city (Exeter) in 1454, being infected with the leprosy, notwithstanding his great wealth, submitted himself to a residence in this hospital, where he lived many years, and finished his days, and was buried in the chancel of the chapel. His grave, with a mutilated inscription, is still extant."*

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* Rope-makers were long treated and shunned as lepers, because their trade was one which at an early part of the middle ages was principally followed by pilgrims and crusaders who had returned in a leprous condition from the East. (Ogée's Histoire de Bretagne.—Hensler's Abendlandischen Aussatze, (1790), p. 212.)

† Records of the Burgh of Prestwick, p. 28.

‡ In the list (p. 10.) of fifty-eight "burges inhabitant ye burghe of Prestwik" in 1507, occur the two significant surnames of "Allane Leppar" and "Adame Leppar."

§ Burgh Records of Glasgow, presented to the Maitland Club by Mr Smith, p. 1 and 127.

‖ Memorabilia of Glasgow, p. 55.

Some of the leper hospitals were specially endowed for persons above the lower ranks, who happened to become affected with the disease. In 1491, Robert Pigot gave by will, to the leper hospital of Walsingham, in the arch-deaconry of Norwich, a house in or near that town for the use of two leprous persons "of good families."†

The malady was found among the clergy as well as among the laity, and some of the English leper hospitals were specially founded for the reception of leprous monks alone—as the hospital of St Lawrence, near Canterbury, and, according to Tanner,‡ that of St Bartholomew, at Chatham. From one of the edicts issued by Henry II. during the height of his quarrel with Archbishop Becket, it would appear that the dignitaries of the church occasionally did, or at least might, employ Lepers in the high character of nuncios, for, in order to prevent Becket from putting the kingdom of England under an ecclesiastical interdict, Henry took all precautions that no official letters to that effect should be conveyed into Britain; and to secure this object the more surely, he enacted, that, if any individual did carry thither letters of interdict from the Pope or Archbishop, he should be punished "by the amputation of his feet if a regular; by the loss of his eyes and by castration, if a secular clergyman; he should be hanged if he were a layman; and burned if he were a Leper *(si Leprosus, comburatur)*.§

In the extant account of the British leper hospitals, there are still preserved some instances in which these institutions were founded by the wealthy and noble after they had themselves become the victims of the malady. The leper hospital of Mayden Bradley, in Wiltshire, was founded by a female member of the rich family of the Bysets;‖ Camden alleges, by a daughter of Manasser Byset, sewer to King Henry II., after she had herself become a leper. "This hospital," says Leland, "was builded by one of the three heirs general of the Bisets, who, being a Lazar, gave her part of the town of Kidderminster, *in pios usus.*[*]

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* Alexander Jenkins's History and Description of the City of Exeter, and its Environs, Ancient and Modern, &c. (1806), p. 384.

† Index Monasticus, p. 61. Monasticon Anglicanum, (2d edit.) Vol. vi. p. 769.

‡ Notitia Monastica, p. 211.

§ Lord Lyttelton's History of the Life of Henry II. and of the Age in which he lived. (Lond. 1767.) Appendix of Documents, Vol. iv. p. 220.

‖ See Monasticon Anglican. Vol. vi. p. 643, 2d edit.

If the earlier biographical notices that we possess regarding the nobility of Great Britain were as minute on their private as on their martial and political lives, we might probably have to record many more notices in regard to their bodily maladies of an import similar to the following:—The youngest son of Robert Blanchmains, Earl of Leicester, was himself a leper, and in the reign of Richard II. founded a leper hospital, dedicated to St Leonard, on the north part of the town of Leicester.[†]

The royal families of England and Scotland did not always remain exempt from the suspicion, at least, and accusation of leprosy, if not from the actual attack of the disease.

Henry III. courted Margaret, Princess of Scotland, and the sister of Malcolm IV. The royal lady preferred the brave Hubert de Burgh, the minister of the English king. Hubert's enemies afterwards alleged to King Henry, that he (Hubert) had dissuaded the Scottish princess from accepting the hand of the English monarch, by telling her "that Henry was a squint-eyed fool, a lewd man, a *Leper*, deceitful, perjured, more faint-hearted than a woman, and utterly unfit for the company of any fair and noble lady."—(Articles of Impeachment, as given by Speed.)[‡]

In reference to this unfounded accusation, I may state that Ryland mentions it as a local tradition, that the leper house of Waterford in Ireland was founded by King John, (the father of Henry III.) in consequence of his son's being affected at Lismore with an eruption that was supposed to be leprosy.[§] But, even supposing the tradition correct, it could scarcely have been Henry, the eldest legitimate son of John, since, at the date of his father's expedition into Ireland, 1209 and 1210, Henry was a child of only five or six years of age, and in all probability did not accompany his royal sire.

Different historians have alleged that Henry IV. was affected with leprosy in the latter part of his age. The immediate cause of his death seems to have been epilepsy, terminating, after a time, in an apoplectic attack; and some authors aver strongly, that this was his only disease. Thus, in his

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[*] Leland's Itinerary through England and Wales, (Hearne's edit.), Vol. iv. p. 105.

[†] Chron. MS. Henrici Knyghton in Bibl. Bodl. lib. ii. cap. 2, Monasticon Anglic. 2d ed. Vol. vi. p. 687.

[‡] Agnes Strickland's Lives of the Queens of England, Vol. ii. p. 78.

[§] Ryland's History of Waterford, p. 200. Mrs Gore has founded one of her latest tales, (The Leper House of Janval,) on the idea of William, the third son of the Empress Matilda becoming a Leper. See her Tales of a Courtier, Vol. ii. p. 55. I am not aware whether the tale is so far historically accurate, or merely assumed, as I do not recollect to have met with any notice of the individual history or death of the prince, (the youngest of the three grandsons of Henry I.,) who is the subject of the story.

℞ *Potassæ Hyd.* ʒi. *Sig. Potassæ.* ʒii.; *Infus. Gent. Co.* ℥viii. M. ℥i. *ter die.*

June 22.—Since last report she has continued the treatment prescribed with considerable advantage; her appetite is better; her general health is much improved; bowels continue to be regularly relieved by a mild aperient. There is a discharge of sero-purulent matter from an opening left by the seton. This has been analysed also by Dr W. and does not contain cholesterine. The complexion is less sallow, and the conjunctiva free from any bilious tinge. The tumour has very considerably diminished, is not at all painful. *Utatur bis in die Ungt. Hyd. fort. Cont. Mist. Gent. Co. c. Potassæ Hyd.*

28.—The wound is now healed, and the tumour diminished to the size of a small pigeon's egg.

Nov. 25.—Since last report I have not seen the patient, as she lives in the country, but have been informed of her death, which was caused by a disease totally different to that I have reported.

The above case is very interesting, not only in showing the abnormal secretion of this body, but also from its separating with the other fluid so large a quantity of cholesterine; also the very torpid state of the bowels before the fluid was evacuated from the cyst; and a considerable reduction in the volume of the tumour had been effected by the remedies; and from their altered condition in this respect subsequently, viz. Feb. 16, May 30, and June 22d. Another remarkable fact is, the change which took place in the situation of the tumour after the use of the exploration needle.

The difference of the appearance and character of the enlargement observed in the three portions of this body illustrate very clearly its pathological condition and development. On the right side, the lobular structure was large, and the cells throughout its entire extent appeared to be distended with fluid, although not in that quantity necessary to rupture many, if any of them. On the left side, the lobular structure was much smaller, and approximated more to its natural state, whereas in the central portion, the secretion had accumulated in so large a quantity as completely to rupture the cells, and convert the whole of this portion into a cyst from which the fluid was evacuated.

The questions suggesting themselves are, *firstly*, Whether the disease called bronchocele does not primarily consist in an enlargement of the thyroid body, produced by an increase of the natural secretions into the cells of one or more portions of its lobular structure, as the exciting or predisposing cause shall have greater or less influence; and *secondly*, Whether this fluid does not become altered in character as the vitiated condition of the circulating system may eventually determine.

I have, at the present time, a number of cases of a similar nature under my care, which will enable me, I think, satisfactorily to dispose of the above questions.

ART. VIII.—*Remarkable Case of Suicide from Asphyxia by Choking, from the introduction of a firm Plug into the Fauces.* By P. D. HANDYSIDE, M. D., F. R. S. E., Lecturer on Surgery, and one of the Acting Surgeons to the Royal Infirmary. (Read before the Medico-Chirurgical Society in February 1838.)

THE subject of the following case, Mary Anne Palmer, aged 29 years, was found dead on the 27th December 1837, in the sleeping apartment which she occupied, being previously in a state of robust health. In accordance with the provisions of the Anatomy Act, her body was received by me for public dissection on the 29th December.

The cavities of the head, chest, and abdomen had been already examined, and in the medical certificate which accompanied the body, the deceased is stated to have died of apoplexy.

When the body was brought into my practical anatomy rooms, I carefully examined it anew, with the aid of Dr Mercer, Lecturer on Anatomy and Physiology, then my demonstrator; and we attended especially to the state of the cavity of the skull, and to the appearances on the encephalon and its membranes, which had been previously divided freely.

Nothing, however, that then came under our observation appeared to be in any degree adequate to account for death. Accordingly, I entered a note to that effect in the record of subjects. I did not inquire farther into the facts of the case at that time, (conceiving that the deceased had died of simple apoplexy), but had the lips sewed together to prevent rapid decomposition, as I purposed to reserve this subject for my lectures.

Having had occasion, on the 24th of January following, to demonstrate the muscular structure of the pharynx, I introduced my finger for this purpose into the back part of the mouth, in order to stuff that cavity with hair; but this space I found to be preoccupied by a dense foreign substance, apparently round in form, and impacted between the root of the tongue and the soft palate, so very firmly, as to have cut off the supply of air to the lungs during life by forcibly closing the mouth, and posterior nares.

This extraneous body I was wholly unable to dislodge without previously introducing my finger from below and behind through

" quhen (to state the result in Boece's words) thir ambassatouris was brocht to his presence, he apperit to thair sicht sa ful of *lipper*, that he was repute be thaim the maist horribill creature in erd (on earth.)"[*] Spottiswoode fixes the era of his death in the year 665.[†]

The case of King Robert the Bruce is a more recent and a more authenticated instance of leprosy in the royal family of Scotland. All authorities agree in stating that the Bruce suffered under a " lang seknes," as Wyntoun[‡] expresses it. Froissart, who visited the Scottish Court in the reign of his grandson Robert II. describes, in more than one passage, the Bruce as having been afflicted with and died of "*la grosse maladie*," "sore greved with ye great sickenes"[§] as Lord Berners has translated it.[||] In their editions of Froissart's works, Sauvage,[¶] Buchon,[**] and Johnes[††] severally comment upon "la grosse maladie" of Froissart as signifying the leprosy. I have already adverted to this expression as being quite synonymous in words and meaning with the Saxon term for the disease. Further, that Bruce was really affected with and died of leprosy, seems to be borne out by the evidence of the older historians. Hemingford, a contemporary of Bruce's, describes him as "lepra percussus;"[‡‡] and Walsingham uses the same language both in his Chronica[§§] and in his Ypodigma Neustriæ;[||||] Boece speaks of Bruce as dying of leprosy (ex lepra fato concessit);[¶¶] and Buchanan gives to his disease the more unequivocal name of elephantiasis ("nam in elephantiam incederat.")[***] Leland, in the translation which he has given in the first volume of his Collectanea from the famous Scalacronica, speaks of ambassadors being sent from England to "Murrefe (Moray) the Guardiane of Scotlande in the nonage of King Davy, whos fader dyed of the Lepre;"[*] "*qui mort estoit de lepre,*" in the words of the original works.[†] In the old and valuable Chronicle of Lanercost, which has only been for the first time printed within the last two years, the disease and death of the Bruce are mentioned in terms equally precise. In speaking (p. 254) of Randolph and Douglas entering England in 1326, the Chronicle states that the Scottish army was not led by Bruce in person, because "factus erat Leprosus."[‡] His death is thus announced in a subsequent page (264) of these old and probably contemporary records under the year 1329, "mortuus est Dominus Robertus Brus, Rex Scotiæ, leprosus."

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[*] Bellenden's Transl. of Boece's Chroniklis of Scotland, Vol. ii. p. 102. (Edit. of 1821.) Dempster's Historia Ecclesiastica Gentis Scotorum, (1627) p. 278.

[†] Spottiswoode's History of the Church of Scotland, Edit. of 1665) p. 21. See also Fiacre's story in Lesslie de Origine, Moribus, &c. Scotorum (1578,) p. 156.

[‡] The Orygynale Cronykil of Scotland, (Macpherson's edit.) Vol. ii. p. 136.

[§] I have already shown in Part i. that the name here given to the Leprosy by the old French historian exactly corresponds with the Anglo-Saxon designation of the disease "*seo mycle adhl.*" It perhaps deserves to be added that (as appears from a paper of Dr Ainslie (Asiatic Researches, Vol. i. p. 287) the term "*Peri Vishadi*" applied to tubercular leprosy by the Brahmins of Hindustan, also literally signifies "the great disease."

[||] Sir John Froissart's Chronycles of England, France, &c. translated at the command of Henry VIII. by Lord Berners, London edit. of 1812, Vol. i. p. 19. In p. 28, he again states, " it fortuped that King Robert was right sore aged and feble, for he was greatly changed with the great sicknes, so that there was no way with him but death."

[¶] Froissart, Histoire et Cronique, (edit. of 1559), Vol. i. p. 13.

[**] Collection des Memoires Nationelles, &c. Tom. x. p. 61.

[††] Johnes' English edit. of Froissart's Chronicles, (1839) p. 18 and 26.

[‡‡] Hemingfordii Chronicon (Hearne's ed. 1731) Tom. ii. p. 270.

[§§] Camden's Anglica, Normannica, &c. a veteribus Scripta, (Frankf. 1603) p. 129.

[||||] Ib. p. 610.

[¶¶] Scotorum Historia (Paris edit. 1574) p. 308. Bellenden's Translation, Vol. ii. p. 40. " He deceissit in lepre."

[***] Rerum Scoticarum Historia, (1762) p. 224.

I shall close these remarks by alluding to one other reputed case of leprosy in a descendant of the royal families of Scotland. The celebrated Constance, Duchess of Britanny, who was allied to the royal families both of England and Scotland, (being a granddaughter of Malcolm III. of Scotland, and the English Princess Margaret Atheling, and at the same time a descendant of a natural daughter of Henry I.,) is generally alleged by historians to have suffered and died from leprosy.[§] William of Nangris (as Lobineau observes) "has shown that she died of leprosy, (*de la lepre*), a disease with which females were occasionally attacked in these times." Lobineau places the date of the decease of Constance in the year 1201.

SEX OF THE LEPERS.

The modern history of Tubercular Leprosy would seem to show that the disease attacks the male in a larger proportion than the female sex. From the table which Dr Adams collected and published of patients, admitted into the leper house of Funchal, Madeira,[‖] from 1702 to 1803, it appears that during that period 526 infected males were admitted into the hospital, while the corresponding list of infected females amounts only to 373. The enumeration of the lepers in the Glasgow leper hospital in 1589,[¶] and those entered into the Greenside hospital of Edinburgh in 1591, (the only two old lists of patients of such institutions in Britain that I am acquainted with), show the diseased inmates of these two establishments to have been all males. A large proportion of the English lazar-houses seem from the language of their charters to have been endowed entirely for males *(fratres leprosi)*, but, at the same time, we have abundant evidence in the same documents that females often suffered from the disease. * Some of the lazar-houses were founded and endowed for admitting infected inmates of both sexes (*fratres et sorores leprosæ.*) Thus Tanner states that the old lazar-house of St Nicolas York contained both male and female lepers. † Mackarell and Bridges both mention the same fact with regard to the hospitals of St Nicolas at Lynne Regis,‡ and of St Leonard at Northamptom; § and the inmates of the leper-house of St Giles, Shrewsbury, bore, according to Owen and Blakeway, ‖ the style of the Prior, Brethren and Sisters of St Giles. A few of the English hospitals were indeed entirely devoted to the reception of leprous females. Thus the hospital of Mayden Bradley was founded in the time of Henry II., for those of the female sex only (*pro mulieribus leprosis;*) and the hospital of St James, Westminster, (which, says Bishop Tanner, stood on or near the place now occupied by the palace of the same name,) was destined, as the renewed charter of Henry III. bears, for fourteen leprous girls (*quatuordecim Leprosis puellis.*)¶

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[*] Collectanea de Rebus Britannicis, Vol. i. p. 552.

[†] Scalacronica; a Chronicle of England and Wales, from 1066 to 1362, by Sir Thomas Gray of Helon. Maitland Club edition (1836) p. 19.

[‡] Chronicon de Lanercost, 1201—1346, presented in 1839 to the Maitland Club by Mr Macdowall.

[§] Histoire de Bretagne; par Gui Alexis Lobineau, (Paris 1707) Tom. i. p. 135.

[‖] Adams on Morbid Poisons, p. 287.

[¶] Cleland's former and present state of Glasgow, (1840) p. 20.

AGE OF THOSE ATTACKED—DURATION OF THE DISEASE.

There are no documents, (as far as I am aware,) which directly throw any light on the age of the inmates of the leper hospitals. The expression, however, of *puellæ*, which I have just quoted as applied to the inmates of St James's Hospital, shows the youth not less than the sex of the inmates of that institution, and so far demonstrates that the disease then, as it does now, sometimes attacked its victims very early in life. Baldwin IV. of Jerusalem, (whose case I have already referred to,) was affected with the disease while still a minor, and surrendered his crown at the age of 23, in consequence of the ravages which the disease had by that time made upon his constitution. " He died young," says Fuller, " at five and twenty years of age—a king happie in this, that he died before the death of his kingdome."**

King Robert the Bruce, another, as we have already seen, of the royal victims of the malady, died at the age of 55.†† But it is difficult to fix the precise date of the first attack of the disease in the case of the Scottish king, and hence difficult to deduce the exact duration of the malady in this particular instance. His faithful biographer, Barbour, describes him as "tuk with sic a sicknes" before the battle of Inverury in 1207, "that he mycht nothyr rid na ga"*—(that he might neither ride nor walk.) Kerr, in his History of the Life and Reign of the Bruce, seems to hint that this was the commencement of the disease which ultimately carried him off;† and indeed, Barbour, in a subsequent part of his poem, describes his fatal malady as "beguth"—(begun)

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* The five lepers in Papa in Shetland about 1736 were all females, (see 2d part, p. 21.)

† Monasticon Anglicanum, Vol. vi. (2d ed.) p. 710; and also Madox' Formulare Anglicanum, (1702) p. 22, 255, 314, &c.

‡ Mackarell's History and Antiquities of King's Lynn, (1738) p. 223.

§ Bridges' History of Northamptonshire, 1791, Vol. i. p. 363.

‖ History of Shrewsbury, (1825.) Vol. ii. p. 173 (engraved seal of the House.)

¶ Monasticon Anglicanum, Vol vi. p. 637 and 643.

** Historie of the Holy Warre, p. 102.

†† Hailes's Annals of Scotland, (1797,) Vol. ii. p. 146.

> throuch his cald lying
> Quhen in his gret myscheiff wes he.—P. 407.

But if the affection commenced in so acute a form at that date, it must have lasted for the long period of twenty-two years, as his death did not take place till 1229. If the disease under which the king suffered so severely in 1207 had been leprosy, it would not in all probability have left his activity and individual prowess for so long a date unimpaired. The battle-axe which, on the evening before the battle of Bannockburn, cleft at a single blow the helmet and skull of Henry de Bohun, could scarcely have been wielded by the arm of one whose body had for some years previously been the seat of a mortal disease. Some facts, however, would seem to show that the malady had assumed a marked and severe form a considerable time before the Bruce's death. I have already shown, from the Chronicle of Lanercost, that, three years before his demise, the Bruce was already so incapacitated by the inroads of the leprosy, that he was unable to undertake the command of the army in their descent upon the northern counties of England.‡ The same reason rendered him, as we are informed by Barbour, unable to attend the peaceful nuptial feast of his son at Berwick in 1228. It may not be considered uninteresting to add, as a part both of the history of the man and of the disease under which he was labouring, that, during these three last years of his life, and whilst "the sicknes" affected his body "so fellely," (to use Barbour's words,) "and him trawaillat sa that he considered death certen," his naturally energetic mind was still active and vigorous. The accounts of his Chamberlain, preserved in the Register Office of Edinburgh,§ show that, during the very last year of his life, he was busied in making experiments on ship-building and navigation in his retirement at Cardross Castle, near the banks of the Clyde, in Dumbartonshire. Within a month before his death, he indited from this place a letter, (the original of which still exists among the old archives of Melrose Abbey, preserved in the General Register-House, Edinburgh,[*]) desiring his heart to be buried within the precincts of that Monastery,—a wish which he changed a short time before he expired into the well known commission to his favourite follower and friend, "ye gentle knighte of Douglas," viz. "I woll yat, as soone as I am trespassed oute of this worlde, ye take my harte oute of my body, and embaume it, and present it to the Holy Sepulchre at Jeruslem, saying, my bodie can nat come."[†]

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* Jameson's edition of Barbour's Bruce, Book vi. p. 167.

† Kerr's History of Robert the Bruce, (1811,) Vol. i. p. 332–3, and Vol. ii. p. 474.

‡ Froissart gives the same cause for the Bruce not leading the expedition in question, (See Lord Berners' Translation of his Chronicles, Vol. i. p. 19.)

§ Chamberlain's Accounts, (printed copies,) Vol. i. p. 37. Compotum Constabularii de Cardross.

HEREDITARY TRANSMISSION OF THE LEPROSY.

Few facts in the history of tubercular leprosy seem to be more universally admitted by all writers on the disease, both ancient and modern, than the transmission of the predisposition to it from parents to offspring. The Greek and Arabian physicians considered it as a malady in which all the fluids of the body were equally diseased (corrumpens pariter omnes humores corporis.) Fit itaque (adds Haly Abbas, the well-known Arabian author of the tenth century, in his chapter "De Elephantia"), cum humoribus spermatis corruptio, cum et humores et sperma ex sanguine fiant, in tantum, ut in generatione passio haec transeat in filios." (Theoric, Lib. viii. cap. 15.) Avicenna and the later Arabian authors, with Theodoric, Lanfranc, and other European writers of the middle ages, express a similar belief in the hereditary transmission of the disease; and in the same spirit, our countryman Gilbert, writing, as we have already seen, in the thirteenth century, observes, " Lepra est interdum morbus primus, sicut ex spermatibus primis matris et patris Leprosis. Sanguis enim corruptus interius, qui est nutrimentum foetus, corrumpit foetum."*

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[*] See a beautiful lithograph copy of this interesting document in the second volume of the Bannatyne Club copy of the Liber Sanctae Mariae de Melros.

[†] Froissart, (Berner's Translation,) Vol i. p. 29. Shortly afterwards Froissart states, "And thus, soone after thys, noble Robert de Brouse, Kyng of Scotland, trespassed out of thys incertayne worlde, and his hart was taken owte of his body and embawmed, and honourably he was entred in the Abbey of Donfremlyne." When the grave of the Bruce was opened at Dunfermline in 1818, the anatomical appearances on the skeleton showed that the king's will had been so far obeyed, the bones of the chest being found divided in such a way as to have allowed the removal of the heart. This piece of dissection seems, at the time at which it was made, to have drawn down the dreaded vengeance of the Vatican upon Randolph, Earl of Moray, the king's nephew, and apparently the operator in this case, in such a way as forms a strange and startling contrast with the medical usages observed towards the dead at the present day. I quote the account as a curious point in the march of necroscopic anatomy from the Appendix to the Chronicon de Lanercost, (p. 428.)—"It appears that, by a constitution of Pope Boniface, the mutilation of a dead body subjected those by whom it was mutilated to heavy ecclesiastical censures. To free himself from these censures, Randolph, two years after the death of King Robert, presented a petition to the Pope, setting forth that the deceased king had intended to undertake a crusade against the Saracens, but was prevented by death, and that in his last will he expressly ordered his heart to be taken out of his body and carried in such an expedition, which was done by James de Douglas, who conveyed it into Spain. The Bishop of Moray was employed to obtain from the pope a remission for the crime, dated 8th before the Ides of August, in the fifteenth year of Pope John's pontificate." Raynald in his Annal. Ecclest. gives the extract A. D. 1329, § 81.

Amid the scattered fragments relative to the former history of leprosy in this country, it can scarcely be expected that we should have preserved for us any individual data bearing directly upon the transmission of the disease from father to son. I have met, however, with one notice, which, though imperfect, it may not be considered uninteresting to quote in regard to the present question. In the burgh records of Glasgow for 1581, Patrick Bogle is ordered to be inspected for leprosy; † and eight years afterwards, (1589) " Robert Bogill, *sone* to Patrick Bogle," is reported as an inmate of the leper-house belonging to the city.‡

It is unnecessary to adduce the opinions of modern authors in support of the occasional hereditary transmission of leprosy, as all observers who have described the disease from their own observations, and that in the most different and distant parts of the world, seem uniformly agreed upon this point. Dr Heineken, in his account of the inmates of the leper hospital at Funchal, Madeira, in 1825,§ states that in three of the cases no hereditary taint was known; the aunt of a fourth (p. 21) was a lazar; the uncle and two brothers of a fifth (p. 18) laboured under the same disease; the mother, brother, and son of a sixth (p. 19), were lepers, and all of them affected before himself; and in a seventh case (a female aged 35) her father, mother, three sisters, and two brothers had already all died of elephantiasis.

Among the seven cases of elephantiasis seen by Dr Kinnis in the Mauritius, and so accurately described by him in a preceding volume of this Journal, three were Mozambique slaves, and could give no satisfactory account of their parentage. Of the remaining four —the first could give no history of her father and mother, but had brothers and sisters in perfect health: the ancestors of the second patient had not been affected with leprosy, but her husband had laboured under it for two years before death: the third case was a daughter of these parents, and one of her brothers had died of elephantiasis: the fourth patient appeared to have inherited the predisposition from the family of his maternal grandmother, who was never attacked herself, but who lost two sisters and three nieces by the disease.

These and other similar data show that the predisposition to leprosy, like the predisposition to other hereditary diseases, may occasionally show itself only in one or two individual members of a family; and may sometimes lie dormant for one or two generations, to reappear in a subsequent one. "God and Nature," says the reverend author of a description of the Faroe Isles, formerly quoted, "deals wonderfully with such people (lepers) in their marriages, for amongst the children, they beget some clean and some unclean. It has also been taken notice of, that two living together in marriage, though the one be found infected, they live together as before, as long as one doth but murmur of it till the magistrate doth separate them, and yet the sound remaineth uninfected; whereas another is often taken with the disease by a very little conversation . . . . What is this? but that God confirms the truth of his word, taking pleasure in them that live in a just wedlock, and wander in lawful ways, putting their hopes in him, that neither fire nor water, contagious disease, nor dangerous pestilence shall hurt them."

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* Compendium Medicinae, (Lugd. 1510), p. 336.

† See the Maitland Club Burgh Records of Glasgow, p. 127.

‡ See Memorabilia of Glasgow, p. 55.

§ Edinburgh Medical and Surgical Journal, xxvi. p. 15 seqq.

‖ Ibid. Vol. xxiv. p. 286.

In some of the few districts of Europe in which cases of the disease have continued to linger down to a late period, the malady seems to be transmitted through an old hereditary taint in particular families, rather than generated by existing external circumstances acting on the bodies of those who now become its victims. The tubercular leprosy exists still, or at least existed lately in the districts of Martigues and Vitrolles[†] in the south of France. The cases, though very few, have still been well marked. M. Vidal, who, towards the end of last century, described several instances of the disease which he saw at Martigues, states, that, with one problematical exception, the malady was in every case hereditary.[‡] "May we not," he adds, "conclude from this, that, if the local causes which are generally assigned for leprosy be true, they have not, at least in our country, sufficient power to originate the disease, (la faire naître), but generally only to develope and perpetuate it in the descendants of ancient lepers.[§]" The same family predisposition probably perpetuated the malady for some generations in the few cases that occurred in Shetland, in the latter part of the last century. The case of the Shetlander, Berns, as mentioned in a preceding part, was an instance in which the disease was apparently the result of hereditary transmission from his ancestry.

The predisposition from hereditary constitution to leprosy, and some other diseases, was well known to our forefathers; and, if we place credit in the account of the "auld manneris" of the Scotch antecedently to the reign of Malcolm Canmore, as "compilit be the nobil clerke, Maister Hector Boëce, Channon of Aber-

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[*] Debes' Faeroae et Feroa Reserata, p. 311.

[†] Dictionnaire des Sc. Medicales, Tom. xi. p. 419; Rayer's Treatise on the Diseases of the Skin (London, 1831) p. 740 and 747.

[‡] Memoires de la Soc. Roy. de Medecine, (1776), p. 167.

[§] Ib. (1782-83), p. 188.

dene," they were accustomed to practise hygienic measures that were assuredly more summary than humane, in order to arrest the diffusion of disease by such channels. For, to quote the words of Boece:—"He that was trublit with the falling evil, (epilepsy) or fallin daft or wod, (insane), or having sic infirmitie as succedis be *heritage* fra the fader to the son, was geldit (*castratus*), that his infekit blude suld spreid na forthir. The women that was fallin *Lipper*, or had any other infection of blude, was banist fra the cumpany of men, and gif scho consavit barne under sic infirmitie, baith scho and hir barne war buryit quik, (if she conceived a child under such infirmity, both she and her child were buried alive.")[*]

EXTERNAL EXCITING CAUSES OF LEPROSY IN THE MIDDLE AGES.

The investigation of the causes of diseases has, probably more than any other department of medicine, been marked by belief without evidence, and assertion without facts. The history of the opinions which have at different times been so freely offered and adopted with regard to the production of Leprosy, and the numerous explanations which have been proposed with respect to the causes of its almost epidemic prevalence in Europe in the middle ages, and its nearly complete suspension in the same region of the world at the present day, might easily, if time and space permitted, be made to form a chapter highly illustrative of the above general remark. The frequency of the disease in former times has been confidently ascribed by different authors[†] to peculiarities in the diet, dress, personal and domestic habits, &c. of our forefathers. And certainly their mode of life was in many respects specially calculated to generate derangements and eruptions of the skin. The good old Saxon practice of bathing[‡] appears to have become forgotten after the date of the Norman conquest; and in the subsequent history of these early times, we might trace various indirect and direct causes of cutaneous disease, in the close hovels and unventilated dwellings of the period;[§] in the habits of personal uncleanness;* in the rough straw bedding then generally† in use, and which "hard lodging" Hollinshed describes as still used by the servants in his day, "with seldome, (he adds,) "anie sheete vnder their bodies to keepe them from the pricking straws that run oft through the canvas, and rase their hardened hides;"‡ and probably also in the articles of diet § on which the general community were obliged to subsist in times before the improvement of agriculture, and the introduction of that "schamefull intemperance," (as old Boece‖ fanatically terms it,) "when na fische in the see, nor foule in the aire, nor beast in the wod may have rest, but are socht heir and thair to satisfy the hungry appetit." For the investigation of this and other allied questions in the history of the production of our older epidemic and endemic diseases, the works of Hollinshed, Strutt, Henry, Chalmers, Macpherson, and others, contain a great and available mass of materials. But, in consequence of the unforeseen extent to which our present remarks have already lengthened out, we are forced to abstain from entering into this topic, and discussing the notes which we have collected in regard to it. At the same time, how-

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[*] Bellenden's Translation of Boece's History, p. lviii.

[†] See, for example, among non-medical authors, various of these causes alleged for the disease in Heron's History of Scotland, Vol. ii. p. 266, (unwholesome diet, uncomfortable lodgings, dirty clothing.) Hooker's Iceland, Vol. i. p. 189, (ascribes it to former use of woollen garments.) Taylor's Index Monasticus, p. xii. (owing to personal filth, close and bad lodging, &c.) White's Natural History of Selborne, Letter 37, (formerly produced by poverty, want of fresh meats, and vegetables, &c.) &c. &c. Similar opinions are offered in various medical works.

[‡] The Canons of the Anglo-Saxon Church urged it as a duty upon the charitable to give to the poor, meat, mund, fire, fodder, bedding, *bathing*, and clothes. Wilkin's Leges Anglo-Saxonicae Ecclesiasticae et Civiles, p. 94. Turner's History of the Anglo-Saxons, Vol. ii. p. 72.

[§] Hollinshed mentions the "multitude of *chimnies* latelie erected" as one of the "three things marvellouslie altered in England" about the beginning of the sixteenth century. (Chronicles of England, &c. Edit. of 1807, Vol. i. p. 317; and

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Strutt's Horda Angel-Cynnan, (1774) Vol. i. p. 104.) When we consider this we shall scarcely wonder that the smoke of coals was formerly looked upon as a noted cause of disease, and was at one time actually prohibited in London and Southwark. (Stow's Survey of London, p. 925. Evelyn's Fumifugium, 1661. Macpherson's Annals of Commerce. Vol. i. p. 474.) In 1307 fires were ordered not to be lighted near the Tower because the Queen was going to reside there, (Macpherson, ut supra, see the edict in Rymer's Foedera, Vol. ii. p. 1057.)

* The last Archbishop of Glasgow, (says Arnott,) put on a clean shirt once a-week.—History of Edinburgh, p. 259.

† Straw was first used for the king's bed in 1242, in the reign of Henry III., whose court was considered the most polite in Europe, (Dr Henry's History of Great Britain, Vol. iii. p. 507.) Some estates in England were held by the tenure of the proprietors finding clean straw for the king's bed, and litter for his chamber, (Henry, ut supra; Camden's Britannia, Vol. i. p. 311; Index Monasticus, p. 12.) In the charter granted by Robert the Bruce to the burgh of Ayr, the providing of this latter item for him and his successors, for three days and nights, whenever they visited the town, is specially entered in the reddenda—"Et inveniendo nobis et heredibus nostris per vices in adventibus nostris et heredum nostrorum apud Are per tres dies et noctes *literium* pro aulâ nostrâ, (Records of Prestwick, p. 128.) The office of rush-strewer was continued till a late period on the list of the royal household.—(Craik and Macfarlane's History of England, Vol. i. p. 644.)

‡ Chronicles, Vol. i. p. 317.

§ Many of the older medical authors lay down various and most contradictory lists of articles of food as capable of producing leprosy—some accusing too great quantities of animal diet—others blaming too much vegetable diet as the cause, while a third class, as Theodoric, impugn too free an use of either or both, (nimium usum carnis vaccinae, buballinae, lentium et omnium leguminum. Theodoric, c. 55.) Some authors state the most strange doctrines on this point. Thus Bernhard Gordon gravely states, that to partake of fish and milk in the same meal does induce leprosy, (comedere lac et pisces in eadem mensa inducit Lepram. Lilium Medicinae, p. 48.) The same idea is repeated from Avicenna down to our countryman, Gilbert, and it is probably not unworthy of being remarked, that the same prejudice in regard to the influence of a mixed fish and milk diet prevails or prevailed till of late, in such opposite points as Madeira and Hindostan (Heberden's paper on Elephantiasis in Madeira, p. 29; Walker in Calcutta Medical and Physical Transactions, Vol i. p. 4 of his Account of the Medical Opinions of the Hindus on Leprosy. See also Sir William Jones's Works, Vol. i. p. 556.)

‖ History and Chronicles, Vol. i. p. lx.

ever, we may pause to observe, that we believe it would be no easy matter to point out the exact differences in those physical conditions of the inhabitants of this country in former and in modern times, which may have led to the prevalence of the disease amongst our ancestors, and to its disappearance amongst us. If poverty in diet, or personal wants, and filth, and wretchedness in their deepest degrees, could generate the malady, there are certainly still numerous spots in continental Europe, and even in our own land, where, unfortunately, all these elements of disease are in our own day in full and active operation, without any such specific result following; the alleged causes are present without the alleged effects.

In order to attain anything like satisfactory results of the supposed physical causes of leprosy in Great Britain in former times, the whole question would require to be thoroughly investigated in connection with two others, viz. the allied physical circumstances, —*firstly*, of the inhabitants of those countries in which the disease in the same way formerly raged,—and *secondly*, of those districts of the world in which it is still prevalent. It is only by following such a line of inquiry that we could hope, if at all, to separate mere matters of opinion from matters of fact, and at last to obtain, by a kind of reasoning by exclusion, the exact physical condition or conditions of a people that are capable of originating or of spreading this particular species of disease. The difficulty of the problem may be easily appreciated by glancing for a moment at the diversified *geographical localities* and circumstances under which the tubercular leprosy is known at the present day to appear. In modern times it has been found existing, to a more or less limited extent, in places the most distant and the most dissimilar in regard to temperature, climate, situation, soil, &c. as in Sumatra,* under the equator, and in parts of Iceland almost within the verge of the Arctic Circle;† in the temperate regions of both hemispheres, as (in the southern) at Hamel en Aarde‡ in the Cape district, and (in the northern) at Madeira§ and Morocco;‖ in the dry and arid plains of Arabia,[*] and in the wet and malarious districts of Batavia[†] and Surinam;[‡] along the shores of Guiana[§] and Sierra Leone,[‖] and in the interior of Africa,[¶] Hindostan,[**] Asia Minor,[††] and Asiatic Russia;[‡‡] on the sea-coast, as at Carthagena,[§§] and thousands of feet above the level of the ocean, as on the table-land of Mexico;[‖‖] on some of the islands in the Indian,[¶¶] Chinese,[***] Caribean[†††] and Mediterranean[‡‡‡] seas, and on the continents of Asia, Africa, and America.

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* Marsden's History of Sumatra containing an account of the Government, Laws, &c. p. 151 and 201.

† See references formerly given to the works of Mackenzie, Olafsen, Troil, Barrow, Henderson, Hooker, &c.

‡ Some scattered records of the leper hospital at Hamel en Aarde, by Messrs Hallbeck and Leitner, are to be found in the "Periodical Accounts relating to the missions of the Church," Vol. ix. p. 345, 482, &c. as kindly pointed out to me by Dr William Brown. In 1824 the hospital contained 110 lepers.

§ See Heberden, Adams, and Heineken's papers already referred to.

‖ Hoest's Reise nach Marokos, p. 248; calls the disease Sghidam (Juddam). Lempriere's Tour from Gibraltar to Tangier, Morocco, &c. in 1789, in Pinkerton's Collection, Vol. xv. p. 689, describes the disease as true leprosy. Jackson's account of the Empire of Morocco, (1801), gives an account of the leper hospital or village near Morocco.

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[*] Niebuhr states that three different varieties of leprosy are known in Arabia in modern times, viz. the Bohak, Barras, and Juddam. "There is (he states) a quarter in Bagdad surrounded with walls, and full of barracks, to which lepers are carried by force, if they retire not thither voluntarily. They come out every Friday to ask for alms."—Pinkerton's Collection of Voyages, Vol. xviii. p. 170.

[†] Dejean in Hensler's Ablendländischen Aufsatze, p. 240.

[‡] Schilling, De Lepra, p. 20. Stedman's Narrative of Five Years' Expedition in Surinam, (1796) Vol. ii. p. 285.

[§] Bajon's Memoires pour servir à l'Histoire de Cayenne, &c. Vol. i. p. 237. Bancroft's Natural History of Guiana, p. 385.

[‖] Winterbottom's Account of the Native Africans in Sierra Leone, Vol. ii. p. 113.

[¶] F. Moore's Travels into the Inland parts of Africa, (1738), p. 130. Mungo Park found the disease among the Madingoes. See Pinkerton's Collection, Vol. xvi. p. 877.

[**] Whitelaw Ainslie in the Transactions of the Royal Asiatic Society, Vol. i. (1824) p. 282. Robinson in the London Medico-Chirurgical Transactions, Vol. x. (1819) p. 27.

[††] Pococke's Description of the East, Vol. ii. p. 122; or Pinkerton's Collection, Vol. x. p. 502.

[‡‡] Voyages de Pallas en differentes Provinces de Russie (Paris, Edit. of 1769), Vol. i. p. 651 and 659.

[§§] Ulloa's voyage to South America, (London edit. of 1762), Vol. i. p. 45, &c. Ulloa states that, at the time of his visit to Carthagena, all the lepers of the place were confined in the hospital of San Lazaro, and if any refused to go, they were forcibly carried thither. The hospital consisted of a number of cottages, and the ground on which it stood, was "surrounded by a high wall, and had only one gate, and that always carefully guarded."

[‖‖] My friend, Dr Cheyne, lately of San Luis, informs me that the hospital of San Lazaro, in the city of Mexico, is set aside for the reception of cases of tubercular leprosy.

[¶¶] As in Ceylon (Marshall's Medical Topography of Ceylon, p. 43); Mauritius, (Kinnis in Edin. Med. and Surg. Journal, Vol. xxii. p. 286); Madagascar, (Narrative of Madagascar Mission, p. 208 and 191). I am informed by Dr Shortt that one of the group of the Sechelle Islands is used as a leper station. See further Crawfurd's History of the Indian Archipelago, (Edinburgh, 1820), Vol. i. p. 34.

[***] As in Java, (Cloyer in Miscell. Naturae Curiosorum, Dec. i. Ann. 2, (1683), p. 7); Amboyna, (Valentyne's Beschreibung von Amboyna, Vol. ii. p. 249. Clarke's Observations on the Diseases of Long Voyages, Vol. i. p. 128.)

[†††] Casan, in the Memoires de la Soc. Medicale d'Emulation, Vol. v. p. 102. Hillary on Diseases of Barbadoes, p. 322. Alibert's Monagraphie des Dermatoses, Tom. ii. p. 289; Case from Guadaloupe. Peyssonnel's Report on the Lepers in Guadaloupe in Philosoph. Trans. Vol. i. p. 38, &c. &c.

[‡‡‡] As in Scio, according to information given me by Dr Clarke. Howard in his Account of the principal European Lazarattoes, mentions, p. 40, the leper hospital in Scio. Hennen in his Medical Topography of the Mediterranean, states that Elephantiasis is endemic in one small village in Cephalonia, p. 275. Savary seems to have met with several cases in the Islands of the Archipelago, (Letters on Greece, 1788, p. 110.)

CONTAGION AS A CAUSE OF LEPROSY.

Most modern pathologists seem inclined to call in question the contagious nature of tubercular leprosy, as it at present exists in different parts of the globe.

Cullen, Darwin, and Good are almost the only English physicians of latter times that have admitted the contagious character of the disease, and that not from personal observation. The evidence bearing against the doctrine of this mode of its diffusion is principally of a simply negative kind. In some of the districts in which the malady is endemic, the sick are seen to maintain a free intercourse with the healthy, without the disease being frequently or at all communicated to the latter; the nurses of the lazar hospitals are alleged to remain uninfected; lepers often continue long in the midst of their families without spreading the scourge to any of the other members; and occasionally a husband and wife are seen living in wedlock for years, one of them deeply affected by the disease, and the other remaining perfectly sound. Instances exceptional to these general remarks are certainly occasionally observed, as in a case quoted in a previous page from Dr Kinnis, of a wife becoming infected subsequently to both her husband and daughter suffering from an attack of the malady. In such cases as this, however, we must recollect, that the repetition of the disease in two or more members of the same family, may merely depend upon the same external or general morbific agencies, acting upon the constitution of all the sufferers.

At least, whenever, from circumstances, this source of fallacy is avoided, the evidence of the contagion of leprosy seems to become more and more defective. Thus, when the disease happens to be imported in the person of an infected individual from a district in which it is endemic, to one in which it is unknown, the malady seems to have no tendency whatever at the present day to spread to any of the inhabitants of the new and healthy locality. Persons labouring under tubercular leprosy are occasionally, for example, sent from southern stations to England and France. In such not unfrequent cases the malady has never, I believe, been known to be communicated in one single instance from the infected person, to those resident inhabitants of the new district, among whom he was living in free and daily intercourse.*

Did the leprosy extend and prevail over Europe in the middle ages as independently of propagation by contagion as the prepetuation of the disease seems to be in most localities at the present day?

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* It is but proper to add that the tubercular leprosy is looked upon by some pathologists as a disease not originally endemic in any part of the New World, and that it was first imported into and spread through the West Indies, &c. by subjects brought from Africa. Hillary professes himself certain upon this point. See his observations on the Diseases of Barbadoes, (1766) p. 322; and also, for the same opinion, Schilling's Commentationes de Lepra, 1778, p. 20.

If we deferred to the mere opinion of the older medical and historical authors, the contagious character of the disease at that era would appear to be undoubted. These authors express an unanimous opinion on its contagious propagation; and it is not till we come down to the professional writers of the seventeenth century, as Fernelius [*] and Forestus, [†] that we find this doctrine ventured to be called in question.

The evidence, however, left us by the older authorities and physicians on this point, is an evidence of opinion rather than of facts. They have bequeathed to us merely their own dogmatic inferences, without vouchsafing to state any of the individual data upon which their general deductions were founded. As far, however, as we may judge by a few loose fragments which we may still gather up from amid the imperfect and scattered records of the disease, the European leprosy, if it were contagious, when epidemic in the middle ages, was at least less so than the combined medical and popular belief of those times would seem to represent it. In the Edinburgh hospital in 1590, two of the lepers' wives lived uninfected with their husbands; and a few of the English leper hospitals, as those of Rippon, St Magdalen, Exeter, and St Bartholomew, near Oxford, were endowed for the purpose of serving as retreats at one and the same time both for the merely poor and the truly leprous.

Individuals stricken with leprosy were sometimes looked upon by the superstitious spirit of the age as persons directly smitten by the hand of God; and we find in history, traces of rich and noble, and even of royal devotees, endeavouring to expiate their sins, and propitiate the good will of Heaven, by occasionally devoting themselves, and that with perfect impunity, to such duties to the sick as offered the most certain means of calling down the disease upon their own bodies, provided it had been at all so contagious as was generally supposed. Saint Louis (Louis IX.) of France visited the leper hospitals every third month, personally rendered the most abject services to their inmates, fed them, and bathed their sores with his own hands.[‡] Henry III. of England is reported to have annually, on Shrove Tuesday, engaged in the same duties.[§] Robert II., the son of Hugh Capet, enacted the devotee in the same manner, imprinting kisses with his lips on the hands of the Lepers (*ore proprio figens leprosorum manibus oscula, in omnibus Deum collaudabat.*)[||] The old English historian, Matthew Paris, relates in his usual quaint and gossipping style, an anecdote illustrative of a similar degree of charitable penance, and defiance of contagion being practised by the Scottish Princess Matilda, the queen of Henry I. of England. Speaking of some transactions in the year 1105, he observes:

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[*] De Morbis Occultis, Lib. i. c. 12.

[†] Observationes Chirurgicæ, Lib. iv. obs. 7.

[‡] Du Chesne's Historiæ Francorum Scriptores Coaetanei, Tom. v. p. 402. Joinville's Histoire de St Louys (1668), p. 121. Sprengel's Histoire de Medecine, Tom. ii. p. 373.

[§] Joinville ut supra, p. 121. "A celui jour du Jeudi Saint, il lave les predz aux meseaux, et puis les baise."

[||] Du Chesne, ut supra, Tom. iv. p. 76.

"At the same time David, [King of Scotland,] the brother of Matilda, Queen of the English, came to England to visit his sister, and when, on a certain evening, he came by her invitation to her chamber, he found the house filled with Lepers, (*domum invenit Leprosis plenam*) and the Queen standing in the midst, having laid aside her cloak, she with both hands girded herself with a towel, and water being placed in readiness, she began to wash their feet, and wipe them with the towel, and embracing them with both hands, kissed them with the utmost devotion. Upon which, her brother addressed her thus; 'What is this which you are doing, my Lady? in truth if the King knew this, he would never deign to kiss with his lips your mouth, contaminated by the pollution of the lepers' feet!' and she smiling, replied, 'Who knows not, that the feet of an Eternal King are to be preferred to the lips of an Earthly King? Behold it was for this that I invited you, dearest brother—that you might learn by my example to perform similar actions. Do, I beseech you, that which you see me doing.' And when her brother had made answer, that he would by no means do such things, as she persevered in her employment, David with a smile withdrew."*

In quoting against the alleged strong contagion of the olden leprosy, the preceding instances of complete exposure to the infection of the disease, and yet, at the same time, of complete escape from it in some well known historical personages, let it not be inferred that the victims of the malady were usually looked upon by the general community with feelings of devotion and pious commiseration. On the contrary, the subjects of this "*foedissimus omnium morborum*," were, as a body, regarded alike by the church and by the people, as objects of disgust. The Council of Ancyrus decreed that lepers were only to be allowed to worship amongst the Hyemantes or those public penitents, who, on account of the enormity and turpitude of some of their sins, were obliged to stand in the open air, and not even allowed to come under the porch of the church.† The Council of Worms granted to lepers a liberty of receiving the sacrament of the body and blood of Christ, but not with those in perfect health.‡ Guido de Monte Rocher, in his Manual for Curates, states, that to some lepers the sacrament cannot be given, because "non possunt corpus Dominicum sic recipere et tractare in ore suo, quin rejicerent ipsum, sic multi, quibus reciderunt labia et dentes et sunt totaliter corrosi usque ad guttur."*

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* Historia Angli Major, p. 42.

† Ruel's Collectio Conciliorum, 1675, Tom. i. p. 1108.

‡ Dupin's History of Ecclesiastical Writers. London edit. 1695, Vol. vii. p. 131.

The preamble to the laws of the Hospital of St Julian's, drawn up by Abbot Michael, asserts, that "amongst all infirmities the disease of leprosy may be considered the most loathsome, and those who are smitten with it ought at all times, and in all places, and as well in their conduct as in their dress, to bear themselves as more to be despised, and as more humble than all other men." The canons of the Church of Scotland, as drawn up in the thirteenth century, deal with the unfortunate lepers more humanely than most other ecclesiastical judicatories, for after recommending them to be admonished to respect the churches of their districts, it is added that, if they cannot be induced to do so, let no coercion be employed, seeing that affliction should not be accumulated upon the afflicted, but rather their miseries commiserated, (*cum afflictis addi non debeat afflictio, sed ipsorum miseriis sit potius miserandum.*")† But the contempt displayed towards them seems to have been almost proverbial as late as the age of Elizabeth. Thus Shakspeare makes Margaret of Anjou exclaim to the afflicted and suspicious Henry VI. after the murder of his uncle, the Duke of Gloucester,

> Why dost thou turn away and hide thy face?
> I am no loathsome Leper, look on me.‡

Maundrell, one of our early English travellers in Palestine, alludes to some cases of leprosy in terms pourtraying simply but strongly the fearful effects and character of the disease. After speaking of some cases of leprosy that he met with in his journey, he states, (to quote his own words,) "At Sichem, near Naplosa, there were not less than ten lepers,—the same number that was cleansed by our Saviour not far from the same place, that came a-begging to us at one time. Their manner is to come with small buckets in their hands to receive the alms of the charitable, their touch being still held infectious, or at least unclean. Their whole distemper was so noisome that it might," (he adds,) "well pass for the utmost corruption of the human body on this side the grave."§

Various authors have alleged that the institution of leper hospitals, and laws for the separation and seclusion of the infected, were formed more from imitation of the Levitical institutions regarding the leprosy than from direct observation and proofs of the contagious character of the disease. The avoidance, however, and separation of the sick, have been recommended and followed by authors and by communities over whom the Levitical laws could have exercised no influence, direct or indirect, and to whom, indeed, these laws were in all probability totally unknown.

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* Manipulus Curatorum (Bremen, 1577), p. iv. c. 9.

† Concilia Magnae Britanniae, Tom. i. p. 616. Can. lxxii.

‡ Second Part of Henry VI. Act. iii. Sce. iii.

§ Maundrell's Journey from Aleppo to Jerusalem at Easter, A. D. 1697, in Pinkerton's Collection, Vol. x. p. 380–81.

After describing the horrors and course of elephantiasis or tubercular leprosy, the old Roman physician, Aretaeus, adds, "seeing the infected with this disease are such who would not fly them (*aufugiat*), or who would not turn aside from a leper, even although he were a son, or a father, or a brother, since there is fear lest the disease should be communicated (*quum metus est ne morbus communicaretur.*) Hence, many have banished those that were dearest to them into solitudes and mountains."*

A knowledge of the laws and customs of the Jews in all probability never reached, or at least certainly never influenced the opinions of the inhabitants of Tonquin—a kingdom which was formerly a part, and long a tributary of China, and where the general religion is the idolatry of Fo and of Lanzo, with sects of the literati or followers of Confucius;† yet in that country those infected with leprosy are treated on the same principles of separation from the general community as we find applied to them in other and distant districts. "In Tonquin, leprosy is so common," says Richard in his history of that country, "that there are pieces of land assigned where those attacked by it must reside. They are shut out from society; and it is even lawful to kill them if they enter cities or towns."‡ In a country like Tonquin, it is difficult to conceive how laws and usages of this kind could have originated in anything except a belief in the contagious nature of the disease, as derived from the observation of its mode of diffusion. At all events, the old institutions and customs of the different kingdoms of Europe, in regard to lepers, seem all to have been originally founded on such a belief in the possibility of the contagious communication of this dreadful and dreaded disease from the sick to the healthy. These institutions and customs I propose now to sketch very briefly, and that principally as they bear upon the usages formerly observed towards lepers in England and Scotland. I shall consider them as they refer to, 1. The separation of the infected from the general intercourse of society; 2. The laws prohibiting their entrance into towns; and 3. The restrictions under which they were placed as inmates of the hospitals.

SEPARATION OF LEPERS FROM THE GENERAL AND HEALTHY COMMUNITY.

After all that I have already had occasion to state relative to the objects of the leper hospitals, and the selection of the infected, it is almost unnecessary to add, that in Great Britain, as upon the continent,* lepers were obliged, either by law or usage, to seclude themselves from society when once the disease was discovered upon their persons.

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* De Causis et Signis Morborum, (Leip. edit. 1735), p. 71.

† Baron's Description of the Kingdom of Tonqueen, p. 104; or Churchill's Voyages, Vol. vi. p. 158.

‡ Richard's History of Tonquin, contained in Pinkerton's Collection, Vol. ix. p. 728.

The chancery warrant of Edward IV., quoted in the second part of these papers, speaks of the retirement of a leper from society as a matter of custom and duty, and empowers the sheriff of the county to remove the suspected person to a secluded place, as is the usage *(prout moris est,)* provided the actual existence of the disease were made out.†

There exist in the old records of Scotland, both local and general enactments enforcing the retirement and seclusion of lepers. The Scottish "Burrow Lawes" *(Leges Burgorum,)* are generally allowed to have been drawn up as early as the twelfth century.‡ They are a code intended apparently for the government of the four first royal burghs of Scotland, viz. Berwick, Roxburgh, Edinburgh, and Stirling. Their sixty-fourth chapter contains some regulations regarding "lippermen." The first of these regulations provides in the following terms for the lodgement in hospital and sustenance of the "lippermen" of the burghs:—§

"Gif ony man dwelland or borne in the King's Burgh is striken with leprosie, and hes substance and geir of his awin to sustaine and cleath himselfe, he sall be put in the hospitall of that burgh quhere he dwells. And gif he hes na thing to liue upon, the burgesses of that burgh sall make ane collection amongst them, for meat and claith to him; and that collection sall be the summe of twentie shillinges."||

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* See various enactments of the French provinces on this head, given at length in Delamarre's Traite de la Police, (Paris, 1722,) Vol. i. p. 636.

† See the document previously cited from Rymer's Foedera, Vol. xi. p 635. I quote the following notice from Poulson's Antiquities of Beverley, (London, 1829,) Vol. ii. p. 773, as an instance of what in all probability not unfrequently took place in these times, viz. the voluntary entrance of lepers into the lazar-houses. "Item, in the year of our Lord 1394, one Margaret Taillor, a leper, came before the twelve governors of the town of Beverley in the Guildhall, and prayed license by intuition of charity to have one bed, (et petiit licenceam here [habere] unum lectum,) in the leper-house without Keldgate bar, which said twelve governors, viz. Nicelas Ryse, William Pollesta, &c. by their common consent have granted.—Lansdoune MS., No. 896, fol. 116."

‡ Skene alleges that these laws were made by David I., who died in 1152–53. George Chalmers states, that, from allusion to them in a charter to Glasgow bearing date 1176, they were at least by that time in existence.—Caledonia, Vol. i. p. 726. See further remarks in the Essays of Anderson, Lord Hailes, &c.

§ Skene's Regiam Majestatem. The Auld Lawes and Constitutions of Scotland, (edit. of 1774) p. 241.

|| The economical measures generally adopted for the sustenance of the poor lepers are only too significantly shown in the following public statute passed in the Scoon Parliament of 1386. "Gif ony man brings to the markit corrupt swine or salmond to be sauld, they sall be taken by the Bailies, and incontinent, without ony question, sall be sent to the lepperfolke, and gif there be na lepperfolke, they sall be

The Canons of the Church of Scotland, as drawn up or authorized by the provincial ecclesiastical councils held at Perth in the years 1242 and 1269, speak of those attacked by leprosy in this country, as being "separated from society in accordance with general custom, (*de consuetudine generali a communione hominum separantur*) and retired to secluded situations."*

I have already, in Part II., quoted a clause from the acts of the Perth Parliament of 1427, empowering and enforcing the dignitaries and officers of the church to search diligently in their parish visitations for any persons affected with leprosy, and to commit them to the keeping of either the civil or ecclesiastical authorities, according as they happened to be "Clerkes" or "Seculars."

PROHIBITIONS AGAINST THE INFECTED ENTERING TOWNS.

Lepers were compelled, by other reasons than mere custom or common law, to retire from society. They were of necessity driven to seek the asylum of the lazar hospitals in consequence of the statutes, both of the general country and of local communities prohibiting any citizen from retaining a person labouring under leprosy in his house, and preventing the infected from entering within the gates of the towns and villages.†

The old Scottish Burrow Lawes have stringent clauses upon this head, for they hold that "na man should presume, or be so bauld as to harberie or ludge ane lipperman within the burgh, under ane full amerciament." And further, "lippermen sall not enter within the towne, bot in passing throw it, and sall not gang fra dure to dure, but sall sit at the ports of the burgh, and sall seek almes fra them that passes in and comes furth."‡

By the later general act of the Perth Parliament, the unfortunate beings affected with the disease were again prohibited from entering towns except for the purpose of purchasing victuals, and this they were only allowed to do on three days of the week, the act strictly providing that—

"*Item*, Na lipper folke, nouther man nor woman, enter nor cum in ane Burgh of the Realme but thrise in the oulk, (week) that is to saie, Mondaie, Wednesdaie, and Fridaie, fra ten hours to twa after noone; and quhair faires and mercattis fallis on thay

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destroyed alluterlie, (entirely.)" Acts of Robert III. in the Regiam Majestatem, p. 414.

* Transcribed from the Chartulary of Aberdeen in the Wilkin's Concilia Magnæ Britanniæ, Tom. i. p. 616. Can. lxxii.

† See the edicts to this effect of the state and city of Modena in Muratori's Antiquitates Mædii Aevi, Vol. iii. p. 54; the Synodial statutes in 1247 of the Church of Le Mans in Martene and Durand's Collectio Veterum Scriptorum, Vol. vii. p. 1397: Ib. p. 1363, &c.: and also the various laws enacted by the Magistrates of Paris in Delamarré's Traite de la Police, Vol. ii. p. 636—7, &c. &c.

‡ Regiam Majestatem, Burrow Lawes, chap. 64, p. 241.

dayis, that they leave their entrie in the Burrowes, and gang on the morne to get their living."*

Various towns and local judicatories in the country seem to have at different times passed laws enforcing more strictly the observance of exclusion of the infected from their own limits and districts. Some of these local enactments have been preserved; and I shall quote such as I have been able to discover, with a view to show the general fear formerly entertained of the contagion of the disease, and the measures that were adopted to prevent its communication.

Thus, in the Statutes of the Society of Merchants or Guildry of Berwick-upon-Tweed, said to have been drawn up by the mayor and others in "the Zeare of God 1283–84," it is strictly provided, that "Na lipper man sall enter within the portes of our burgh; and gif any by chance enters within them, he sall be incontinent put forth be the sergant of the burgh. And gif any lipper man uses commonlie contrair this our discharge, to come within our burgh, his claithes wherewith he is cled sall be taken from him and sall be brunt, and he being naked, sall be ejected furth of the burgh. Because it is provyded be the common councill, that some gude man sall gather almes to them that they may be sustained in ane place competent for them without the burgh. And this is to be understand of lipper folk, indwellers within the burgh, and not of them quha dwells without the burgh."†

Some of the smaller burghs and villages of these early times had their individual rules and statutes upon the same point. The burgh of Prestwick, Ayrshire, which contains at present, and probably never contained more than about 1000 inhabitants, is situated about half-a mile north of the Leper Hospital of Kingcase. The old official records and statutes of this small burgh, to which reference has repeatedly been made in the preceding pages, have lately been printed from the original MS. by Mr Smith of Swinridgemuir. The earliest burgh record that has thus been preserved is a collection of the laws of the burgh, "Statuta Burgi de Prestwick maide by the haile consent of the community of the same at the Cross of the same burgh, and to be keepit and rafit unremittable and unrevocable." The date of this collection, or probably recollection of the burgh laws, is 1470. The fourth of the statutes fixed upon "for the common profit of the said burgh in time coming for everlasting memorans" is to the following effect:—

"It is statut yat na man inhabitant ye said burghe or weman commoun or intromet with ye sic folk (commune or intromit with the sick people) of Kingcase, vnder ye pain of exiling ye said burghe when thai ar ourtane (overtaken) be ane enquest yairupon, mair plainli yan ony oyder persounis or persoun duelland in all ye land about."—P. 15.

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* Murray's Acts of the Scottish Parliament, Vol. ii. p. 18.

† Regiam Magestatem, p. 273.

In the minuted records of the burgh, different cases occur of persons accused in accordance with this statute. Thus, on December 1, 1477, Anne Kerd and Andro Sauer are accused of repairing to Kingcase.* On the 26th April of the second following year, 1479, it was alleged with regard to the said Andro Sauer, that he "repairis till Kingcase daily and nigtly and his wif and his bairnis."† This Anne Kerd seems to have had the property of a burgess. At last in November 1481, the same rebellious Prestwickian, "Andro Sauer, is fund in daili reparand to Kingcase, and yis the xxti court yerein, and is abill till infect ye hale toune; and weris ye seik folkis clathis and bonnettis."‡ After this date no more mention is made in the records of Andro, who repeatedly figures in them previously, for other more serious deeds than that of repairing to Kingcase. I find, however, that others of his name, and probably of his kindred, fall into the same error for which he himself appears to have been banished. Thus in 1496, Anne Sauer, Marion Myllar, Ellane Browne, and Anne Duncane, "are ilkane severale in amerciamentis for the selling of ale and intromettin of the folkis of Kingcase again the statutis of the towne."

Few or none of the very early records and laws of the magistrates of Edinburgh have been preserved, but, amidst some lately recovered, of a date as late as 1530, we find the following statute anent the "Leper Folke,"—"It is statut and ordanit be the Provost, Baillies, and Counsell of this burghe that na manner of Lipper persone, man nor woman, fra this tyme furth, cum amangis uther cleine personis, nor be nocht fund in the kirk, fische merket, nor flesche merket, nor na other merket within this burghe, under the pane of burnyng of their cheik and bannasing off the toune."§

Some of the old edicts and regulations made in regard to the diseased in London have been preserved for us by Stow. According to the record of Edward III., that king sent in 1346 "a commandment under his Great Seal, to the mayor and sheriffs of London, willing them to make proclamation in every ward of the city and suburbs, that all leprous persons within the said city and suburbs should avoid within fifteen days, and that no man suffer any such leprous person to abide within his house, upon pain to forfeit his said house, and to incur the king's further displeasure. And that they should cause the said lepers to be removed into some out places of the Fields, from the haunt and company of all sound people."‖ From some of the city records it further appears, that the magistrates ordered "That the lepers walk not about the streets nor tarry there; that the keepers of the gates swear that they will not permit lepers to enter into the city." "There was at one time," adds Stow, "a breif for removing them from the city and suburbs. At another time there was an edict for levying an hundred shillings out of a tenement of the lepers, and delivering it to their officers for sustaining them."*

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* Records of Prestwick, p. 27.

† Ibid. p. 28. ‡ Ibid. p. 29.

§ Liber Statutorum Burgi de Edynburgh—in the Maitland Club Miscellany, Vol. ii.

‖ Strype's Edit of John Stow's Survey of the cities of London and Westminster, (1720), Vol. ii. Book ii. p. 74.

RESTRICTIONS PLACED UPON THE INMATES OF THE LEPER HOSPITALS.

The chance of contagion was provided against by other means besides the mere separation of the infected from the community, and their banishment to the lazar-hospitals. In many instances the regulations and statutes to which the lepers were subjected, as inmates of these hospitals, were strongly restrictive, and framed with a view of preventing them spreading the disease to others by any dangerous degree of personal communication with the healthy. The occasional severity of the restrictions to which with this view the leper inhabitants of the hospitals were subjected, affords us a curious example, both of the great dread in which the disease was held, and of the extent and stringency of the measures of medical police which the local judicatories of this country had, in these times, both the power and the will to exercise.

The rules of the Greenside Hospital, Edinburgh, present in themselves a striking proof of this, and the occupants of the hospital were bound to observe these rules under the penalty of death. "That this," observes Arnott, "might not be deemed an empty threatening, a gallows was erected at the gavel of the hospital for the immediate execution of offenders."†

The persons placed in the Greenside Hospital in 1591 were five male lepers with two of their wives, viz. (to quote the record) "Robert Mardow, James Garvie, Johnn Mac Rere, James Wricht, and Johnn Wilderspune, Lepperis, togidder with Isobel Barcar, spous to the said Robert Mardow, and Janet Galt, spous to the said James Garvie." Among other regulations enacted in regard to them it was specially ordained, "That nane of the said Personis Lepperis, or their wyffes, depart or resort fra the said hospitall, to na oyder pairt, or place, bot sit still thairat, and remayne thairin nicht and day, halyday and wark-day; and that they resave na oyder maner of personis, oyder man or woman within the said place, bot sic as sall be placit with thame thairin, at command of the said Counsall and Session; and that they keip the dure of the said hospitall fast and clois, fra the dounpassing of the sone to the rysing thairoff, under the payne of hanging"

"That the said Jonet Galt only cum to the markatts for buy-ing sic viveris as is necessary to the saids personis, and presume to gang to na oyder pairt nor place in her cuming and returning to and frae the said markatts, under the payne aforesaid. Quhilk and other injunctions being red to the personis foresaids, they agreit thairto, and promisit to obey and underly the samyn, under the paynes therabove written. And thairfore, for the better obedience thairof, and for terrefying the said lepperis to transgress the samyn, the said commissioners has thocht meitt and expedient, that there be ane *gibbet* sett up at the gavell of the said hospital; and that the forme and order thairof be insert baith in the buiks of Counsall and Sessioun of this burgh, *ad perpetuam rei memoriam.*"*

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* Stow's Survey, Vol. ii. p. 21.

† Arnott's History of Edinburgh, p. 258.

The tenor of the regulations of the British leper-hospitals was probably in few or no other cases so extremely stringent, as in the establishment at Greenside. At least, if we may judge by the records of most of those hospitals, the rules of which have been accidentally preserved, the restrictions placed upon the inmates, were confessedly great, but certainly by no means so severe, either in their degree, or in the punishment applied to them, as in those which we have just cited. Besides, in most institutions the prior, master, or warden of the hospital, exercised a discretionary power in relation to the degree of seclusion of the lepers of their establishment.

Thus, among the rules of the leper hospital or St Magdalen, Exeter, it was provided that " no brother or sister shall go or pass out of the house beyond the bridge, without the gate of the said hospital, without the license of the Warden or his deputy, upon pain to be put into the stocks, and to have but bread and water for one day."†

Again, among the many rules enacted by the Abbot Michaele, for the regulation of the hospital of St Julian, in the neighbourhood of St Albans, I may select the following as characteristic illustrations of the point which we are now considering:—

" Let no one presume to trangress the bounds fixed of old, (*metas ab antiquo statutas*), of which one is placed in the south, another in the north, as they still remain in view, except the custor of granges and granaries, to whom the charge is committed to the master.

" Let no brother venture to enter the bake-house or brew-house in any manner, with the exception of the brother to whom the charge is assigned, who, when he enters, may not approach the bread and beer, in touching or handling them in any way; since it is not meet that men of such infirmity should handle those things which are appointed for the common use of men.

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* MS. Records of the Town-Council of Edinburgh, Vol. ix. p. 123.

† This and the other laws of St Magdalene's, Exeter, are to be found at p. 30, &c. of an interesting essay of Dr Shapter's of that city, entitled, " A few observations on the Leprosy of the Middle Ages." The essay, which was printed for private circulation, was kindly forwarded to me by the author after the publication of the first part of the present papers.

"Let no one of the brothers attempt to go beyond the bounds of the hospital, namely, in the direction of the king's road, without his close cape, in going to church or returning, nor stand or walk about in the said street before or after service; (nor, indeed, at any hour of the day before or after dinner) but when divine service is finished, let them enter their hospitals with all haste, unless any one wishes to remain in the church, that he may have leisure for prayer and meditation. In like manner, we command that there be no standing in the corridor, which extends in length before the houses of the brothers in the direction of the king's road; and that no brother hold conversation there (*teneat ibi parliamentum*) with another; but if any brother wish to hold colloquy with another, let one go to the other in order, as he may wish, through the said corridor, without standing by the way, unless some stranger chance to meet him, with whom he may briefly speak and pass on. But if an honest man and true come there, for the purpose of visiting an infirm brother, let him have access to him, that they may mutually discourse on that which is meet."

In considering under a previous head the extent of endowment of the British leper hospitals, we have seen that the inmates of many of the poorer institutions depended more or less entirely for their means of subsistence upon the casual alms which they were able to beg from the charitable. In a few favoured cases the lepers were specially authorized to pursue this occupation beyond the district of the hospital. A charter was given by King John to the lepers of St Lawrence's hospital, Bristol, granting them great privileges of this kind. Some of the passages in this charter are curious as illustrative of the present point. I append a translation of a part of it from the copy of the original document, as published by Dugdale:—

"John, by the grace of God, King of England, &c. to the Archbishops, &c. greeting, know ye that we, for the love of God, have granted, and by this charter have confirmed to the lepers near Bristol, a croft beyond the gate of Lacford, on the road to Bath, to dwell there, as the charter which we gave them while we were Count Moreton reasonably proves; know ye also that we have received these lepers into our protection, and therefore desire and command that ye befriend and protect them, (*quod eos manu teneatis et protegatis*) and cause no impediment to them, wherever they shall be asking alms in our lands, as our letters-patent which we granted unto them, when Count Moreton, rationally testifies," &c. †

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* Matthew Paris' Historia Angli. Additamenti, p. 162 and 166.

† Monasticon Anglicanum, Tom. ii. p. 438.

Grants and liberties, such as the above, were certainly, however, rare. In general the lepers were restricted as to the districts and places in which they presented themselves to seek for alms. We have already seen the Burrow Lawes ordering that they "sall not gang fra dure to dure, but sall sit at the ports of the burgh, and seek alms fra them that passes in and furth;" and the Scottish Parliament of 1427 enacted that they should not be allowed to sit and beg "neither in kirk nor in kirk-yairde,* nor other places within the burrowes, but at their owne hospital, and at the part of the towne and other places outwith the burrowes." But even in exercising this vocation in these stated places, the unfortunate petitioners seem to have been every where obliged to use certain precautions, with the view of prohibiting them diffusing the disease.

In Scotland and in various other parts of Europe they were obliged, for this purpose, to use a "clapper," or rattle, in order that the noise created by it might warn the healthy of the presence of an infected fellow mortal, whilst, at the same time, they carried a "cop" or receiving dish, into which the charitable might drop their alms.† Muratori tells us that in Italy the lepers made their presence known at a great distance *(longe positos)* by the noise of a certain piece of wood. Marmotrecti describes more minutely the instrument as composed of wood, and formed of two or three tablets of it which the leper struck together when seeking bread (*quas concutit leprosus quaerendo panem.*) ‡

In the celebrated old Scoto-Saxon poems of Sir Tristrem, composed probably about the middle of the thirteenth century, § and valuable (to use the words of an acute critic)‖ "for its pictures of ancient manners," and the customs "of Scotland in the days of Alexander III.," the hero of the romance is, at one stage of his adventures in Cornwall, represented as assuming for disguise and concealment, the appearance of a leper or mesel.[*] In this character the poet provides him with the usual cop and clapper, (stanza 80, p. 181.)

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* In former times the church-yards seem to have been the general resort of beggars. Aeneas Sylvius, who visited Scotland as the Pope's Legate in the reign of James I., speaks of these seeing the almost naked paupers (pauperes, pæne nudos; ad templa mendicantes) supplied with coals as alms. Historia de Europa, c. 46. Sibbald's Chronicle of Scottish Poetry, Vol. i. p. 176.

† We have seen, in a previous page, that the lepers met with by Maundrell, in Palestine in 1697, carried a kind of "cop," or, as he expresses it, they came "with small buckets in their hands to receive the alms of the charitable." Evelyn, in his interesting memoirs, alludes to a curious mode of sending alms to the leper that he saw practised 100 years ago in Holland. In his Diary, under the date of 26th July 1641, he states, "I passed through Deft to the Hague, in which journey I observed divers leprous poor creatures dwelling in solitary huts on the brink of the water, and permitted to aske the charity of the passengers which is conveyed to them in a floating box that they cast out." Bray's edition of Evelyn's Memoirs, &c. Vol. i. p. 12.

‡ Antiquitates Italicæ Medii Aevi, Tom. iii. p. 54.

§ Sir Tristrem, a metrical Romance of the thirteenth century, edited by Sir Walter Scott, (Edinb. 1804) Introduction, p. 12.

‖ Tytler's Historical Inquiry into the ancient state of Scotland, History, (2d edit.) p. 306 and 337.

Ganhardin gan fare.
  Into Bretaine away;
And Tristrem duelled thare,
  To wite what men wald say;
Coppe and Claper he bare,
  Til the fiften day,
As he a mesel[*] ware:
  Under walles he lay,
    To lithe.

We have already in the second part of the present paper seen Henrysone in the sixteenth century describing his leper heroine as arrayed,

With cop and clapper like ane Lazarous.

And from the advice proffered by the other lepers to the weeping Cresseid after she is actually removed to the lazar-house, the importance and frequent use of the clapper is sufficiently shown.

I counsall thee mak virtew of ane neid,
Go leir to clap thy clapper to and fro,
And leir after the law of lepper leid.[†]

Into some towns the lepers seem to have been allowed the liberty of entry, provided they used their clappers, to advertise the passing inhabitants of their presence, and thus allowed them to shun the supposed danger of their contact. The magistrates of Glasgow made the carrying of clappers one of the conditions on which they admitted the occasional entrance of the inmates of the Brigend hospital into their city, one of their edicts for October 1610 running thus: "It is statut and ordanit that the Lipper of the hospital sall gang (walk) only on the calsie (street) syde near the gutter, and sall haif clapperis and ane claith upoun their mouth and face, and sall stand afar of quhill they resaif almous, or answer under the payne of banischeing them from the toun and hospital."

One of the statutes of the Greenside hospital, Edinburgh, was to the effect,

"That nane of the lepperis cry or ask for almes, utherways then be thair clapper; and that every ane of thame, his day about, sitt at the dore of the said hospitall to that effect, the rest allwayes remaining within the samyn, and that thay distribute equallie amongs thame, quhatsoever money they purches be thair said begging, and gif the just declaration thairof to the visitour appoynted everie Setterday, under sic payne as the counsill shall injoyne unto thame."

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[*] In Robert de Brunne's translation (made in the reign of Edward the Third) of Peter Langtoft's Chronicles, the same term "mesel" is used as synonymous with leper, and applied to one designated in the rubrics "Baldeiano Leproso."

Baldewyn the Meselle, his name so hight, . . .
For foul meselrie he comond with no man.

John Trevisa has rendered the Lepra of Glanville by "Meselry" in translating, in 1398, the treatise De Proprietatibus Rerum. See the London edition of 1535, p. 109–110.

[†] Testament of Cresseid, as previously quoted.

LEPERS REGARDED AS DEAD PERSONS BY THE CIVIL LAW. According to the tenor of various old civil codes and local enactments, when a person became affected with Leprosy, he was looked upon as legally and politically dead, and lost the privileges belonging to his right of citizenship.

By the law of England, lepers were classed with idiots, madmen, outlaws, &c. as incapable of being heirs; and a leper removed by a writ *de leproso amovendo* could not be a guardian in socage.*

Rotharis, King of Lombardy, as early as the eleventh century, decreed, that, when any one became affected with leprosy, and the fact was known to the judge or people, so that the leper was expelled from society and dwelt in seclusion, he had no power to alienate his effects or dispose of them to any one, (*non sit illi licentia res suas alienare aut thingare cuilibet personæ.*) For, it is added, from the very day on which he is expelled from his home, he is to be regarded as dead, (*tanquam mortuus habetur.*)† The same was the law of Normandy, according to Dufresne‡ and Delamarre;§ and Lobineau, in his history of Brittany,‖ speaks of it being formerly in accordance with the rituals of various churches.

The leper was not looked upon in the eye of the law alone as defunct, for the Church also took the same view, and performed the solemn ceremonials of the burial of the dead over him on the day on which he was separated from his fellow-creatures and consigned to a lazar-house. He was from that moment regarded as a man dead amongst the living, and legally buried, though still breathing and alive. The ritual of the French church retained till a late period the various forms and ceremonies to which the Leper was subjected on this day of his living funeral. Ogée ¶ and Pluquet ** have both described them.

A Priest robed with surplice and stole went with the cross to the house of the doomed leper. The minister of the Church began the necessary ceremonies by exhorting him to suffer, with a patient and penitent spirit, the incurable plague with which God had stricken him. He then sprinkled the unfortunate leper with holy water, and afterwards conducted him to the church, the usual burial verses being sung during their march thither. In the church the ordinary habiliments of the leper were removed; he was clothed in a funeral pall; and while placed before the altar between two trestles, the *Libera* was sung, and the mass for the dead celebrated over him. After this service, he was again sprinkled with holy water, and led from the church to the house or hospital destined for his future abode. A pair of clappers, a barell, a stick, cowl, and dress, &c. &c. were given to him. Before leaving the Leper, the Priest solemnly interdicted him from appearing in public without his leper's garb,—from entering inns, churches, mills, and bakehouses,—from touching children, or giving them ought he had touched,—from washing his hands or anything pertaining to him in the common fountains and streams,—from touching in the markets the goods he wished to buy with anything except his stick,—from eating or drinking with any others than lepers;—and he specially forbade him from walking in narrow paths, or from answering those who spoke to him in the roads and streets, unless in a whisper, that they might not be annoyed with his pestilent breath and with the infectious odour which exhaled from his body;—and last of all, before taking his departure, and leaving the leper for ever to the seclusion of the lazar-house, the official of the church terminated the ceremony of his separation from his living fellow-creatures by throwing upon the body of the poor outcast a shovelful of earth, in imitation of the closure of the grave.

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* Lord Coke's First Institutes of the Laws of England, (Thomas's edit.) Vol. ii. p. 193, and Vol. i. p. 162.

† Lindenborg's Codex Legum Antiquarum, (1613,) p. 609.

‡ Observations sur l'Histoire de S. Louys, (in edit. of Joinville's Life of Louis for 1668. Appendix, p 34.)

§ Delamarre's Traite de la Police, (Paris, 1722,) Vol. ii. p. 636.

‖ Lobineau's Histoire de Bretagne, Vol. i. p. 204; Mezeray's Histoire de France, Tom. ii. p. 168–69.

¶ Dictionnaire Historique et Geographique de la Bretagne, (1778,) p. 176.

** Essai Historique sur la ville de Bayeux, (1829,) p. 254, seqq.

APPENDIX.

List of Leper Hospitals in Great Britain.—

In Part I., I enumerated specially the different Scottish leper hospitals with which I was acquainted, and referred in general terms to the number of similar institutions that had existed in England. Under the idea that a connected view of all the British leper hospitals might prove interesting, I have drawn out the following alphabetical list of such of them as have come to my knowledge in the course of the preceding inquiries. To the locality of each hospital and its special designation, or rather dedication, I have added the dates, as nearly as they could be ascertained, either of its original foundation, or of the first notice of it to be found in historical records. Among the unarranged mass of materials contained in the Notitia Monastica, and in the Monasticon Anglicanum (to which works I am principally indebted for the notes of the English leper houses) references exist to many old hospitals, the individual objects of which are now utterly forgotten and unknown. If sufficient records of them had been preserved, we would probably have been enabled to increase to a much greater extent the subjoined list of institutions for lepers, as many of them, there is little doubt, were set aside (like those we now enumerate) for the reception of the victims of that disease, whose olden history, in as far as relates to this country, we have so hastily and imperfectly attempted to trace.

LIST OF LEPER HOSPITALS FORMERLY EXISTING IN GREAT BRITAIN.

Town and County.	*Designation of Hospital or Locality.*	*Date of Foundation or Earliest Notice.*
Aberdeen,	St Anne's.	
Aldcambus, Berwickshire,		Before A. D. 1214.
Aldnestun, Berwickshire,		Before 1177.
Appleby, Westmoreland,	St Nicolas's.	
Athelington, Dorsetshire,	St Mary Magdalene's.	
Aylesbury, Buckinghamshire,	St John's and St Leonard's,	Time of Henry I. or before 1135.
Banbury, Oxfordshire,	St John's,	Time of King John, or before 1216.
Beccles, Suffolk,	St Mary Magdalene's,	About 1327.
Berkhamstede, Hertfordshire,	St John the Evangelist's.	
Berwick-upon-Tweed		Before 1283.
Blythe, Nottinghamshire,	St John the Evangelist,	In time of Pope Honorius.
Bolton, Northumberland,	Holy Trinity,	Before 1225.
Bristol, Somersetshire,	St Mary Magdalene.	
Bristol, Somersetshire.	St Lawrence,	Before 1135.
Brookstreet, near Brentwood in the parish of Southweald, Essex,	St John,	Before 1292.
Burton, Leicestershire,	Blessed Virgins and St Lazarus's ; Burton Lazars,	Time of King Stephen.
Bury St Edmund's, Suffolk,	St Peter's,	About 1327.
Colchester, Essex,	St Mary Magdalene.	
Cambridge,	"Hospital of Lazars,"	Before 1397.
Canterbury, Kent,	St Nicholas's.	
Chatham, Kent,	St Bartholomew's,	In time of William II. or before 1100.
Chichester, Sussex,	St James' and St Mary Magdalene's,	Before 1199.
Chesterfield, Derbyshire,	St Leonard's,	Before 1208.
Crowmersh, Oxfordshire,		About 1248.
Dartford, Kent,	Trinity.	
Dartford, Kent,	St Mary Magdalene,	About 1330.
Devises, Wiltshire,		Before 1207.
Doncaster, Yorkshire,	St James,	Time of Henry III. or before 1272.
Dunwich, Suffolk,	St James,	Before 1199.
Edinburgh,	Greenside,	In 1591, but probably a previous hospital,

Town and County.	*Designation of Hospital or Locality.*	*Date of Foundation or Earliest Notice.*
Exeter, Devonshire,	St Mary Magdalene,	Before 1163.
Eye, Suffolk,	St Mary Magdalene,	About 1330.
Glasgow, Lanarkshire,	St Ninian's,	In 1350.
Gloucester,	St Margaret's,	Before 1320.
Goreleston, Suffolk,		Mentioned in 1372.
Hardwick, Norfolk,	St Lawrence's,	Time of Edward II. or before 1327.
Hedon, Yorkshire,	St Sepulchre,	Before 1216.
Hereford,	St Giles'.	
Herting, Sussex,	St John the Baptist,	Before 1199.
Hexham, Northumberland,		About 1210.
Hithe, Kent,	St Andrew's,	Before 1336.
Huntingdon,	St Margaret's,	Time of Malcolm IV. of Scotland, who died 1165.
Ipswich, Suffolk,	St Mary Magdalene.	
Ipswich, Suffolk,	St James'.	
Kingcase, Ayrshire,	St Ninian's,	Before time of Robert Bruce ?
Kirby, Westmoreland,	St Leonard's.	
Lancaster, Lancashire,	St Leonard's,	About 1190.
Langwade, Norfolk.		
Langport, Somersetshire,	St Mary Magdalene's,	About 1310.
Lerwick, Shetland.		
Leicester,	St Leonard's.	
Linlithgow,	St Magdalen,	Before time of Alexander II.
Little Maldon, Essex,	St Giles'.	
Lincoln,	Holy Innocents.	
London and vicinity,	St Giles',	In 1101.
———	Highgate,	In 1472.
———	Between Milesend and Stratford Bow.	
———	At Kingsland.	
———	At Shoreditch.	
———	Lock, Kent Street, without Southwark.	
———	St James's, Westminster,	Very early
Long Blandford, Dorsetshire.		
Lowcrosse, Yorkshire,	St Leonard's.	
Lynne, Dorsetshire,	St Mary Magdalene's,	Before 1336.
Lynne, Norfolk,	St Mary Magdalene's,	In 1145.
———	St John's.	
———	West Lynne.	
———	Cowgate.	
———	Letch Hithe.	
Mayden Bradley, Wiltshire,	Virgin Mary,	Before 1135.
Norwich, Norfolk,	St Mary Magdalene's,	Before 1119.
———	St Mary's.	
———	Without St Magdalene's gate.	
———	Without St Bennet's gate.	

Town and County.	*Designation of Hospital or Locality.*	*Date of Foundation or Earliest Notice.*
Norwich, Norfolk,	Without St Giles' gate.	
———	Without St Stephen's gate.	
Northampton,	St Leonard's.	In 11th century.
Otteford, Kent,		Time of Henry III. or before 1272.
Ottely, Yorkshire.		Time of Edward II. or before 1327.
Oxford,	St Bartholomew's,	
Papa Stour, Shetland,		
Peterborough, Northamptonshire,	St Leonard's,	Before 1154.
Pilton, Devonshire,	St Margaret's,	Before 1197.
Plymouth, Devonshire,	St Mary Magdalene's.	
Plympton, Devonshire.		
Pontefract, Yorkshire,	St Mary Magdalene's.	
Racheness in Southacre, Norfolk,	St Bartholomew's,	Before 1216.
Rippon, Yorkshire,	St Mary Magdalene,	Beginning of 12th century.
Rochester, Kent,	St Katherine's	About 1316.
Romendale or Rumney in Kent,	St Stephen and St Thomas.	Time of Baldwin, Archbishop of Canterbury.
Rothfan, Elginshire,		Before 1249.
Selwood, Somersetshire,		About 1212.
Sherburn, Durham,	The Virgins', Lazarus',	Before 1181.
Shrewsbury, Kent,	St Giles',	Before 1189.
Southampton, Hampshire,	St Mary Magdalene's,	
St Albans, Hertfordshire,	St Julian's,	Between 1100 and 1135.
Stamford, Lincolnshire.		
Sturbridge, Cambridgeshire,	St Mary Magdalene,	Very early.
Tannington, Kent,	St James's,	Before 1189.
Tavistock, Devonshire.	St Mary Magdalene.	
Taunton, Somersetshire.		
Tenby, Pembrokeshire,	St Mary Magdalene.	
Tewkesbury, Gloucestershire.		
Thetford, Norfolk,	St John's,	Time of Edward I.
Thetford, Norfolk.	St Margaret's,	About 1390.
Towcester, Northamptonshire,	St Leonard's,	About 1200.
Walsingham, Norfolk.		
Warwick,	St Michael,	Time of Henry I. or Stephen.
Wycomb, Buckinghamshire,	St Margaret and St Giles'.	
Yarmouth, Norfolk,	Outside North Gate.	Before 1314.
York, Yorkshire,	St Nicholas,	About 1110.

ART. X.—*History of a case in which a fluid periodically ejected from the Stomach contained Vegetable Organisms of an undescribed form.* By JOHN GOODSIR, Conservator of the Museum of the Royal College of Surgeons in Edinburgh; *with a Chemical Analysis of the Fluid*, by GEORGE WILSON, M.D., Lecturer on Chemistry in Edinburgh.

MR ———, aged 19, consulted me about a stomach complaint, under which he had been labouring for four months, and which had more or less resisted every attempt made for its removal. He informed me that he considered it to be water-brash; that it attacked him on awakening in the morning with a feeling of distension of the stomach; that, without any effort of vomiting, a quantity of fluid, varying in volume from two-thirds to a whole wash-hand basonful, passed up from his stomach; that after this he was quite relieved, and experienced no further inconvenience till the evening of the same day, when, without decided distension, sounds as of a fluid boiling or bubbling, and proceeding from the region of his stomach, were perceptible to himself and to those around him; that he slept well enough, but was generally attacked in the usual manner next morning. Such was my patient's own account of his case.

On examining more particularly into the symptoms, I could ascertain nothing positive. His tongue and pulse were natural; he had no headach, nausea, or thirst; no tumour could be detected in the epigastrium, and no pain on pressure was complained of in the region of the stomach. The bowels were moved daily, and the stools were normal. His appetite was not affected, and the usual articles of diet appeared to agree with him. He was thin, but had a good complexion, and his flesh was firm. He stated that he had formerly been very fat, but that this had left him before the accession of his stomach complaint. I was informed that one of his testicles had never descended beyond the groin.

Of the various remedies which had been tried for his relief, prussic acid appeared upon the whole to have exercised the greatest influence over the disease, preventing the attacks with considerable certainty for several days in succession.

Being unable to make up my mind as to the exact nature of the case, but conceiving it probable that there might be ulceration or some other organic lesion of the stomach, I ordered croton oil, frictions of the epigastric region, and the internal remedies to be discontinued. I also requested that the ejected fluid might be preserved for my inspection.

Next day I found that he had had an attack in the morning as usual. No new symptoms presented themselves.

On examining the ejected fluid, I was struck with the truth of what had been stated to me, that it smelt like fermenting worts, with a faint acid odour. It appeared, after having stood for a few hours, moderately transparent, and of a light brown colour. It had deposited in the bottom of the bason a quantity of a ropy matter, of a granular appearance; and on the surface was a mass of froth like the head of a pot of porter.

By a consideration of all the circumstances of the case, I was now induced to conceive it possible that this and other cases of similar stomach complaints might depend on fermentation of the contents of the organ. Such a fermentation might, I presumed, be primary, that is, induced by the chemical constitution and relative conditions of the contents of the stomach; or it might be secondary, that is, induced by circumstances in the condition of the organ standing in the relations of primary causes of the whole complaint. But, whatever might be supposed to be the cause of the presumed fermentation, it appeared to me highly probable, that, if it had really taken place, it would be indicated by the remains of ferment-vegetables in the ejected fluid.

In the meantime, till I had examined the fluid more minutely, I merely regulated my patient's diet. Animal food was recommended; vegetables and malt liquors were forbidden, and a little brandy was ordered in water for drink.

I now proceeded to examine the fluid ejected from the stomach, and in proceeding to do so, I expected, if I found any vegetable form at all, to see some of the globular or moniliform algæ, which it now appears pretty certain are concomitants of certain of the fermentations. What was my astonishment then to find, in the first drop I examined, not the vegetables I was led to expect, but numerous individuals of a form, with allies of which the zoologist is familiar! Drop after drop exhibited the same specific form, with a precision which convinced me that I had now to deal with an organism which, whether animal or vegetable, was closely allied to certain genera of BACCILLARIÆ, and much more closely to the genus GONIUM among the VOLVOCINÆ.

Before I proceed with the history of the case, or with the description of the organism which characterized it, it may be well to state, that, in addition to a few fragments and shreds of undigested food, the ejected fluid presented the following microscopic elements.

1*st*, Fecula cells, globular, ovoidal, and kidney-shaped, with well-marked hila of attachment. Some of these cells were transparent and empty, others were full of starch granules, and reacted powerfully with iodine. These cells were at first presumed, and were afterwards proved by comparison, to be nothing more than the remains of wheaten bread.

2d, Much larger, more irregular, flaccid, ruptured, or half emptied cells, full of granular matter, which reacted with iodine, and were recognized as fecula cells of the potato, as they appear after boiling.

3d, Minute shreds of muscular fibre, cellular tissue, and fat cells, remains of the food.

4th, Globules or globular masses, from 500 to 100 of an inch in diameter, apparently oily, and presumed, although as to this no inquiries were instituted, to be some form of the chyme.

5th, Occasionally, but rarely, portions of bran, consisting of the perisperm of the wheat, recognizable by its internal surface presenting irregular-sized, ovoidal or hexagonal shallow foveæ, with included fecula cells.

6th, The organisms themselves, which I at once recognized as belonging to the vegetable kingdom, and considered either as the cause of the symptoms in my patient's case, or at least as very remarkable and important concomitants.

I may state that these organisms could not have been swallowed in the water used for drink, as the water employed by the family for that purpose was regularly passed through a stone filter. I used every precaution also in ascertaining that they could not have been introduced along with any article of diet, and in satisfying myself that they were not portions of any animal or vegetable tissue.

I now recommended a return to the use of the prussic acid. I ascertained that it exercised a decided influence over the disease. After some time, however, I became satisfied that it acted more by enabling the stomach to retain its contents, than by any direct influence in preventing the formation of the fluid itself.

The case proceeded for about a fortnight without any change in the symptoms, the prussic acid being regularly taken at bed-time, with the effect of putting off the attacks occasionally for a day or two at a time.

I now determined to give creosote, from a belief that it would not only act, as the prussic acid had done, in preventing the ejection of the fluid, but that it would also put a stop to its formation. This I conceived it would do, whether the disease arose from a simple fermentation of the contents of the stomach, or from the development of the organisms as a primary cause.

A drop of creosote was ordered every night at bed-time. Supper was forbidden ; a very light dinner of animal food was recommended, and breakfast indicated as the principal meal. Cessation of his somewhat sedentary habits, active country exercise on foot and horseback, and attention to the bowels were insisted upon.

A decided improvement now took place. The attacks, instead of recurring almost every morning, now took place only on the fifth or sixth morning, and latterly at intervals of eight or ten days. The quantity of fluid ejected also diminished in quantity, not exeeding six or eight ounces.

The attacks again increased slightly in frequency, and in quantity of fluid ejected, but this was at once controlled by a gradual increase of the dose to four drops at bed-time. It also appeared advisable to divide the dose, so as to take two drops in the forenoon, and three or four about one hour and a-half after dinner, so as to stop the formation of the fluid. This effect my patient felt satisfied the creosote produced, as the bubbling or crackling sensation in the stomach usually ceased after taking his dose.

The bowels were now acted upon rather smartly, so as to promote the action downwards from the stomach.

At the present date I have it not in my power to state that the complaint is removed, although the attacks are much less frequent, and the quantity of fluid diminished. The creosote, however, has a most decided control over it, and will, I am inclined to believe, ultimately cure it. The disease, indeed, may depend on the patient's time of life, and on the peculiarity of his constitution, and may gradually disappear even without medicine, as a consequence of increased corporeal vigour.

The Structure, mode of reproduction, and development of Sarcina ventriculi, the parasite detected in the ejected fluid.—The following description is drawn up from examination of the ejected fluid for a period of nearly two months.

In every instance the organisms presented themselves in the form of square or slightly oblong plates. The thickness of an individual was about one-eighth of the length of one of its sides. Under a moderate power the sides and angles appeared straight and well-defined; but under deeper glasses, the angles were rounded, and the sides sinuous; appearances which resulted from the uncompressed forms of the component cells in their particular directions. The flat surfaces were divided into four secondary squares by two rectilinear transparent spaces, which, passing from side to side, intersected one another in the centre like two cross garden walks.

Each of the four secondary squares was again divided by similarly arranged, but more feebly developed spaces, into the four ternary squares.

The sixteen ternary squares thus constituted, when examined with deeper powers, were seen to consist each of four cells, which were not separated by transparent spaces, but simply by dissepiments formed by the conjunction of the walls of contiguous cells.

These sixty-four cells of which the organism consisted did not present in perfect individuals distinct nuclei; although in certain instances appearances presented themselves, having relation to the reproduction of the organism, and falling to be described in another part of the paper.

The individual organisms were transparent and slightly yellow or brown. When carefully examined under favourable circumstances the cell-walls appeared rigid, and could be perceived passing from one flat surface to the other as dissepiments. These dissepiments, as well as the transparent spaces, were from compression of contiguity rectilinear, and all the angles right angles; but the bounding cells bulged somewhat irregularly on the edges of the organism, by reason of the freedom from pressure.

These circumstances gave the whole organism the appearance of a wool-pack, or of a soft bundle bound with cord, crossing it four times at right angles, and at equal distances.

From these very striking peculiarities of form, I propose for it the generic term SARCINA.*

Perfect individual SARCINÆ, of the species now under consideration, vary from 800 to 1000 of an inch linear, along each of their sides. They are, as has been stated, slightly brown or yellow under a high power—under moderate glasses they appear dark, and are defined with difficulty on account of the frequent reflections of the light by the dissepiments. Iodine does not react with them, as with starch, but tinges them deep brown or yellow. They shrivel but slightly in alcohol. In nitric acid, even after boiling for some time, the sixteen ternary squares retain their relative position, but diminished and shrivelled, appearing like minute crystalline granules arranged in a square. So persistent are those arrangements of granules in boiling nitric acid, that I at one time suspected the existence of silicious loricæ, or isolated raphides, but as I could not detect the same forms or arrangements in the ashes of the evaporated and calcined fluid, I do not now believe in their existence.

This species of SARCINA, therefore, consists of sixteen four-celled frustules, imbedded in a square tablet of a transparent texture, as in the GONIUMS. The four-celled frustules correspond to the cells or globules; the tablet to the phycomater or gelatinous matrix of certain of the ULVACEÆ.

The generation of SARCINA is fissiparous, each individual dividing into four. This is proved by the following circumstances.

1*st*, Specimens are frequently met with which, instead of 16 ternary squares, and 64 ultimate cells, exhibit 64 ternary squares, and 256 ultimate cells. Such specimens are not, I conceive, to be considered as individuals, in as much as, 1*st*, Their four component squares are very loosely connected together; 2*d*, One or two of the squares may be awanting, or two or more of these may remain attached by the angles,—an arrangement never presented in the primary squares themselves.

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* SARCINULA would have been more appropriate, had not Lamarck already applied the term to a genus of polyps.

2*d*, Large specimens are occasionally met with, which have most of the characters of composite individuals, that is, of individuals about to divide into four. Such specimens do not present 256, but only 64 ultimate cells, and these, exhibiting appearances not easily defined, but apparently consisting of four opaque spots, as if each cell were about to be divided into four parts, or were in the act of producing within itself four new cells.

Such appearances rendered it difficult to say whether certain specimens were simple individuals or composite—single adults, or adults about to divide each into four young ones.

I therefore conclude, that a perfect individual SARCINA consists of 64 ultimate cells, but that as soon as each of these again divides into, or produces four new cells, the individual becomes composite, and may forthwith divide into four young ones, each of these again to undergo the same quaternary division.

Such a mode of generation will account for what I frequently observed,—two, three, or four SARCINÆ attached by their angles only, as in the baccillarian genera. It also explains why I could never detect more than four so united. It may account for the circumstance that the SARCINÆ were found grouped as it were in colonies, in certain portions of the ropy fluid, some drops containing numbers of them, others none at all.

Such is the structure, mode of reproduction, and of development of this species SARCINA.

In tracing these out, it cannot but have been observed how beautiful is the symmetry of all the arrangements—how the parts of the individual are arranged in the square—how these parts increase in numbers in a geometrical progression—1, 4, 16, 64, 256,—and lastly, how the species propagates according to the same law, 4 in the first generation, 16 in the second, 64 in the third, 256 in the fourth, 1024 in the fifth, and so on with a rapidity peculiar to such a series of numbers.

Is SARCINA an animal or a vegetable? is it one of the infusorial Polygastrica, or a minute Alga? In order to give a satisfactory answer to this question, it becomes necessary to analyse the groups to which SARCINA is most closely allied.

Putting out of view for the present the FRAGILLARIÆ, DIATOMACIÆ, and other gonioid organisms, the animal or vegetable nature of which is yet a matter of doubt, I shall proceed to Muller's genus GONIUM, the genus of all others to which SARCINA has the greatest affinity.

The genus GONIUM consists of composite polygastric animalcules, each corpuscule of the whole animal having, according to Ehrenberg, the organization of a monad, oral appendages, visceral sacs, &c. Ehrenberg does not enumerate eye-points among the characters of the family to which the GONIUMS belong, (VOLVOCINÆ). Without coming to any decision as to whether the red points on certain species of GONIUM be really eye-points, or merely optical illusions,* I may state at once, that I am much inclined to believe, that the genus GONIUM, as at present constituted, contains both animal and vegetable species—the former characterized by oral appendages, voluntary motions, (eye-points ?), the latter by their simple cellulo-globular formation. GONIUM PECTORALE, (*Pectoralina Hebraica*, B. St Vincent,) GONIUM PUNCTATUM, contrary to the opinion of Bory St Vincent and others, appear to be true composite animals.

But Ehrenberg has here, as in many other instances, decided for the animal nature of organisms in which even his experienced eye could not detect the characters of the family.

Such is the case with GONIUM HYALINUM, GONIUM GLAUCUM, and probably with GONIUM TRANQUILLUM.

These three species appear to consist merely of cells full of chlorophylle imbedded in the square plate which corresponds to the outer envelope of the NOSTOCHINÆ.

To such forms belongs SARCINA. It exhibits no mouths, no oral appendages, no visceral sacs, and its cells, instead of having the gelatinous appearance so familiar to the observer of the animal infusorials, are clear, transparent as if empty, and have that consistency of wall characteristic of vegetable structure.

Believing SARCINA to be a vegetable, I may state, in reference to its characters, that they are of a kind which distinguish it from all the gonioid plants at present known. It differs most essentially from PECTORALINA HEBRAICA of Bory St Vincent, which, as we have already stated, appears to be a true animal. It makes the nearest approach to GONIUM HYALINUM, which with GONIUM GLAUCUM and GONIUM TRANQUILLUM, even Ehrenberg himself seems inclined to hand over to the botanists under the generic term GONIDIUM.

The generic characters of SARCINA are to be found in the predominance of the constituent cells over the outer coat or lorica, in each frustule being four-celled, and in the entire freedom of these from all coloured contents. Of the specific characters of a single species much cannot be said.

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* It may be well to state, that the red dots do not appear in all the species, and it is interesting to observe, that those species in which they have not been detected are the very species in which oral appendages apparently do not exist.

I define the genus thus:

Sarcina. Plants coriaceous, transparent, consisting of sixteen or sixty-four four-celled square frustules, arranged parallel to one another in a square transparent matrix.

Species 1. Sarcina Ventriculi, *mihi*. Frustules 16; colour light brown; transparent matrix very perceptible between the frustules, less so around the edges; size 800 to 1000 inch. Hab. the human stomach.

As soon as I had detected the Sarcina, I called upon my friend Dr George Wilson for an analysis of the fluid. The following is his report.

"The liquid sent me for examination was thick and viscid; by standing, it deposited a large quantity of ropy matter mixed with portions of undigested food, and when filtered through paper it had a pale brownish yellow colour, and was quite transparent. It still contained much animal matter in solution, becoming opaque and flocculent when boiled, and giving a very copious precipitate with infusion of galls. It also precipitated nitrate of silver densely, and when evaporated to dryness, and exposed to a full red heat in a platina crucible, left an ash containing much chloride of sodium. It had a peculiar acid odour, which all who have observed compare to that of sour beer; it reddened litmus powerfully and effervesced sharply with alkaline carbonates. These remarks and all that follow, apply without exception to portions of liquid ejected at various intervals during a period of four weeks.

To determine the nature of the acid which existed so abundantly in the ejected matter, a pint of the filtered liquid was distilled in a retort, till nine-tenths of the whole had passed over. The fluid in the receiver was colourless but opalescent, and a flocculent matter was diffused through it; it reddened litmus strongly, and gave, with nitrate of silver, a precipitate insoluble in nitric acid, and soluble in ammonia. The latter reaction seemed to point to the acid as the hydrochloric, but as the liquid had not the odour of that acid, and the presence of flocculent matter showed that substances not truly volatile, had been passing over with the vapour during distillation, I suspected that the precipitation of the silver-salt had resulted from chloride of sodium transferred from the liquid in the retort by a similar process of mere mechanical convection. To decide this point, a portion of the distilled fluid was evaporated to dryness in a porcelain capsule, and strongly heated; distilled water poured upon the residue precipitated nitrate of silver, indicating the presence of some fixed metallic chloride.* To remove this, the liquid was filtered from the animal matter it held in suspension, and slowly distilled a second time in a capacious retort. The product of this distillation was colourless and transparent, and possessed a strong acid reaction, but gave not the slightest haze with nitrate of silver. It retained the vomit-smell, and along with it a faint acid odour, which was not perceptible to myself, but which others recognized, and pronounced to be that of vinegar.

To ascertain the nature of the acid, six ounces of the twice distilled liquid were neutralized with lime-water, and evaporated to dryness. The lime-salt was then transferred to a tube-retort, and distilled with sulphuric acid slightly diluted. A colourless liquid collected in the receiver, which was at once recognized by its odour to contain acetic acid. This experiment was very carefully repeated with four portions of liquid distilled from different specimens of the ejected matter; the result was the same with all, an acid liquid was procured, which all who smelled it pronounced to be acetic acid.

I was the more careful in repeating these trials, that Berzelius has shown that in the analysis of animal fluids, other volatile odorous acids may readily be mistaken for acetic acid. He particularly notices that lactic acid, accompanied by a chloride, may seem to be an acetate, when moistened with sulphuric acid; the sharp smell of the evolved hydrochloric acid passing for the peculiar odour of the acetic. Even so expert a chemist as Leopold Gmelin has been deceived in this way.† But the liquid from the stomach, the lime water, and the sulphuric acid, were all tested and found to contain no chloride, nor did the distilled liquid contain any; moreover, the evidence of the acid being the acetic, did not depend on the perception for a moment of a faint and fleeting odour, when the salt was moistened with sulphuric acid; a drachm of liquid was obtained by each distillation, so that the odour could be perceived and identified by many persons. In further trial of the acid, it was ascertained, that when digested in the cold on recently precipitated oxide of lead, it formed a soluble salt, having a sugary taste, and possessing an alkaline reaction. The acquirement of the latter property, depending on the formation of a sub-salt of lead, has been shown by Liebig to be distinctive of acetic acid.*

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* Berzelius has particularly pointed out the difficulty of distilling viscid animal fluids in retorts, without the transference of non-volatile matters, which appear to be projected upwards by the bursting of the bubbles of vapour produced during tumultuous ebullition. Traité de Chimie, Tome vii. p. 616. Ed. 1832.

Liebig has likewise called the attention of chemists to the remarkable power which vapours possess, of carrying along with them portions of bodies (such as nitre, boracic acid, chloride of sodium), which in their solid form resist dissipation by very high temperatures. When such bodies are dissolved in water, its vapour, even when far below the boiling point, determines their volatilization along with itself. Organic Chemistry in its application to Agriculture, 1st Ed. p. 111.

† Berzelius, op. et loc. citat.

The proportion of acetic acid in the twice distilled fluid was ascertained in the usual way with the alkalimeter, by finding the quantity of carbonate of potass required to neutralize it. It was found by several trials, that, on an average, an ounce of the liquid neutralized 0.4 gr. of the carbonate; a quart (32 oz.) would therefore neutralize 12.8 gr. which correspond to 9 gr. of the hydrated (crystallizable) acetic acid $HO + C_4 H_3 O_3$.

The liquid remaining in the retort after the first distillation, was now examined and found still to be strongly acid. This property was traced in part to the presence of a small portion of free hydrochloric acid. The large amount of chloride of sodium which accompanied it made it difficult of detection; nor did I succeed in ascertaining its proportion. But I satisfied myself that it occurred only in small quantity by the following experiments. Some ounces of the filtered liquid, along with a portion of red oxide of lead, were placed in a flask provided with a bent tube dipping into a wine glass, containing a very weak infusion of blue cabbage. The flask was then heated till the liquid boiled, and, by the quantity of vapour sent through the infusion, made the latter boil also. The cabbage was reddened, but not perceptibly weakened in tint; whereas had free hydrochloric acid been present in any quantity, it must have been deprived of hydrogen by the metallic oxide and chlorine evolved. When the experiment was repeated, with the addition to the flask of a little sulphuric acid, the infusion was bleached in a few seconds. A similar experiment was made with the substitution of a solution of hydro-sulphuret of ammonia for the vegetable infusion, with a view to convert any evolved chlorine into muriate of ammonia. The hydro-sulphuret was then evaporated to dryness, and nitrate of silver added; a precipitate of sulphuret and chloride of silver fell, but when the latter was dissolved out by ammonia, its amount was found to be very small. Again, several ounces of the liquid from the stomach were boiled for some time with peroxide of manganese, and thereafter filtered. The filtered liquid was then tested for chloride of manganese, with caustic potash; a very slight precipitate of protoxide fell. As the quantity of hydrochloric acid discovered in this portion of the liquid was too small to explain its marked acidity, I made careful search for another acid, and soon detected the presence of one which was not volatile, but was destructible at high temperatures. Different processes were adopted for the isolation and purification of this acid, which was separated with much difficulty from the accompanying salts and animal matter. I state the results very briefly.

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* Graham's Elements of Chemistry, p. 785.

The concentrated liquid from the retort, which now possessed a dark brown colour and was very viscid, was evaporated on the water-bath till it ceased to lose weight. It formed a gummy mass, which remained moist after many hours exposure to a heat of 212°, and retained unimpaired the power of reddening litmus strongly. The mass was boiled with successive portions of alcohol of sp. gr. 0.880, so long as the latter acquired an acid reaction; the greater part of the animal matter remained undissolved, but the alcohol was coloured dark-brown. On evaporating this solution on the water-bath, a viscid matter was left, strongly acid to litmus, and possessing a saline taste occasioned by the chloride of sodium dissolved along with it. The alcoholic extract was boiled with successive portions of sulphuric ether, recently rectified from carbonate of potass, and ascertained to be quite neutral. By this treatment, the extract lost its acidity, which was transferred to the ether; but it required a large quantity of the latter to remove it entirely. The etherial solution was of a pale yellow colour, and had dissolved very little of the salts or animal matter. When the ether was vaporized on the water-bath, there remained a thick yellow liquid, reddening litmus strongly. It was kept for an hour at the temperature of 212° without drying up; it could be dissolved in water and evaporated to its original consistence many times in succession, without dissipation of the acid; but when left in its most concentrated state, it absorbed moisture from the air, and became more liquid. When exposed in a capsule to a naked flame, it darkened in colour, the animal matter became charred, and the whole was destroyed.

Leopold Gmelin and others have shown that when hydrochloric acid is accompanied by much animal matter, it may be entangled in it, so as to escape dissipation by heat. It will afterwards be shown, that the acid was certainly not the hydrochloric; but to obviate any objection which might be founded on this fact, several portions of the liquid were treated in the following way. Some ounces were concentrated by evaporation, and boiled on protoxide of lead, till the liquid had lost all acid reaction. By this treatment the hydrochloric acid should be converted into the insoluble chloride of lead. The liquid was filtered, decomposed by a current of sulphuretted hydrogen, boiled, and filtered a second time. It yielded a pale yellow fluid markedly acid, which was subsequently treated with alcohol and ether by the method already described. The liquid, after the second filtration, still precipitated nitrate of silver, for it contained all the chloride of sodium originally present. Although this was no real objection to the distinction of the acid from the hydrochloric, I was anxious to satisfy myself that it could be procured quite free from chlorine. With this object in view, several ounces of the liquid were boiled with a portion of carefully prepared and crystallised sulphate of silver, till it ceased to give a precipitate with the nitrate of the same base. A current of sulphuretted hydrogen was then passed through the liquid, to precipitate the excess of sulphate necessarily added, after which it was boiled and filtered. It now contained free sulphuric acid, and sulphates instead of chlorides; it was digested on oxide of lead, until it lost all acid reaction, filtered from the sulphate of lead and excess of oxide, and submitted again to sulphuretted hydrogen, till a precipitate ceased to fall. After being boiled and filtered anew, it was evaporated on the water-bath, and digested with alcohol, which left the sulphates undissolved. The product of these operations, which contained no inorganic acid, reddened litmus strongly.

Other processes were followed, which need not be detailed; none of them yielded an acid quite free from animal matter, nor was it ever procured in large quantity; but it presented the same properties in whatever way obtained. I did not ascertain the solubility of the acid in ether, till the inquiry was nearly concluded, so that some of the experiments hereafter mentioned were made with the alcoholic solution, which was less pure.

The following properties were ascertained by repeated trials to belong to this acid. It was soluble in ether, alcohol, and water, was quite destitute of odour, and neither volatile nor crystallizable. When the aqueous solution was digested on phosphate of lime prepared from bones burned to whiteness, and freed from carbonate of lime by boiling with acetic acid, and subsequent protracted washing with water, it dissolved a large portion of the salt; and it acted in the same way on the recently precipitated phosphate. It formed a soluble salt with oxide of silver, which strikingly ditinguishes it from hydrochloric acid. It formed soluble salts likewise with oxide of lead, with potass, soda, ammonia, baryta, and lime; the last soluble also in alcohol. It sustained a heat of 300° without decomposition, but when the temperature was much elevated it inflamed along with the animal matter accompanying it, and suffered destruction. It was always found, however, that the animal matter gave way before it, for after charring had occurred to some extent, water still dissolved an acid from the mass.

On comparing these properties with the characters known to distinguish the organic acids of animal origin, they will be found to correspond closely with those of lactic acid, which accordingly I believe the acid I have been describing to be. Hydrated lactic acid ($HO + C_6 H_5 O_5$) is stated by Berzelius * and Liebig †

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* Traité de Chimie, Tome vii. pp. 612—620.

† Turner's Chemistry, p. 996.

to constitute a colourless syrupy liquid, inodorous, uncrystallizable, and not volatile, but decomposed at a temperature of 480°. It forms soluble salts with all the metallic oxides, and dissolves a large quantity of phosphate of lime. There is no single decisive test of its presence, nor does it present any other marked characteristics which could be sought for in the acid under examination. One method there certainly is by which the identity of this acid with the lactic could have been ascertained, an ultimate analysis namely, and discovery of its atomic weight; but it was impossible to put this plan in practice. Nevertheless, I think the conclusion will be admitted that the acid was the lactic.

Three acids then were found in the liquid—hydrochloric, acetic, and lactic; the first was present in too small quantity to be considered a morbid product. So far as the organic acids are concerned, it is impossible to say whether their mere presence constitutes a morbid sign, for the statements on record concerning the normal acids of the stomach are very incomplete and unsatisfactory. Dr Prout found in the stomachs of the lower animals no acid but the hydrochloric.[*] Leuret and Lassaigne found only the lactic;[†] Schultz only the acetic;[‡] Chevreul found only the lactic in the gastric juice of dog, and in the liquid brought up by an emetic from the stomach of a healthy man fasting.[§] On the other hand, Gmelin found in the lower animals muriatic and acetic acids, and in the horse butyric acid.[‖] Dunglison, who analysed the gastric juice from the stomach of St Martin the Canadian, whose case has been described by Dr Beaumont, found muriatic and acetic acids.[¶] Dumas, in his Lectures on Organic Chemistry, delivered last summer, (1841,) stated the normal acids to be the muriatic and lactic.[**]

To perplex the inquiry still further, Gmelin admitted no distinction between lactic and acetic acid, or, at furthest, conceived the former to be the latter modified by adhering animal matter. Now that we know these acids to be quite distinct in composition and properties, the observations of Gmelin, otherwise so high an authority, lose much of their value.

In the preceding summary of conflicting opinions, it will be observed, that whilst some chemists contend for lactic, and others for acetic acid, as the normal organic acid of the gastric juice, no one professes to have found both acids in the same liquid, as was the case with that which I have analysed. One of these acids, then, was abnormal, but which? It would be useless attempting to decide this question by an appeal to the relative worth of the authorities quoted ; it is not improbable that both acids are developed during healthy digestion. Lactic acid is so abundant, free or combined, in the milk, blood, urine, and other parts of the body, that its existence in the stomach is almost certain. As for acetic acid, it is a much rarer constituent of animal fluids, and there can be little doubt that lactic acid has often been mistaken for it.

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[*] Phil. Trans. 1824, p. 45.

[†] Recherches Physiologiques et Chimiques, p. 115.

[‡] Muller's Physiology, p. 564.

[§] Leuret et Lassaigne, op. cit. p. 117.

[‖] Recherches sur la Digestion, Vol. i. p. 166–67; Vol. ii. p. 317.

[¶] Muller, op. and loc. cit.

Manuscript notes kindly furnished by Mr Norton.

In the meanwhile however, till new researches are made on this subject, neither acid can be considered by its mere presence as a morbid sign. I may, however, remark, that lactic acid has already been found by Dr Graves in the liquid vomited by a sufferer from dyspepsia ;* and MM. Boutron and E. Fremy, in a paper on the lactic fermentation, observe, " It is known that the liquids contained in the stomach can, in certain conditions, present a strongly acid reaction. Now, the analyses made on this subject demonstrate in these liquids the presence of lactic acid."†

One thing, however, is certain, and it is the main truth elicited by the analysis, viz. that the quantity of acetic acid found in this case was enormous. Although we have no account of the proportion discovered in the gastric juice or chyme, by those who maintain its presence there, it is certain that the quantity must be very small. Prout overlooked the presence of an organic acid altogether, and Gmelin, the great advocate of its existence, found only traces of it. But the quantity of liquid ejected at once by the patient, often amounted to more than two quarts, which would contain eighteen grains of acetic acid ; and the amount is rather understated, for some portions of the liquid were necessarily lost in the distillations, which, moreover, were never pushed to dryness.

I am not aware of any case on record corresponding to this ; but I forbear at present forming any opinion as to whether this remarkable development of acetic acid, and the occurrence of the curious organisms decribed by Mr Goodsir, were mutually dependent or merely coincident.

The liquid otherwise was not particularly examined as to its salts or animal matter."

Those who know the doubt which at present exists as to the acids which are found in the stomach in health and disease, will perceive the value of the foregoing analysis. Other questions arising out of the consideration of the case, as well as its future progress, will be taken up and recorded in future communications on healthy and morbid digestion—subjects with which Dr Wilson and I are at present engaged.

Plate VII. Fig. 2. Sarcina ventriculi in a perfect state.
Fig. 3. One of the four-celled frustules.

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* Transactions of the Association of Fellows and Licentiates of the College of Physicians in Ireland, 1804, Vol. iv. Quoted in Tiedemann and Gmelin, Vol. i. p. 167.

† Annales de Chimie et de Physique, 3me serie, Tom. xii. 1841.

PART II.

CRITICAL ANALYSIS.

ART. I.—*Rheumatism in its various forms, and on the affections of the Internal Organs, more especially the Heart and Brain, to which it gives rise.* By RODERICK MACLEOD, M. D., Physician to St George's Hospital. London, 1842, 8vo, pp. 164.

DR MACLEOD begins his work by a short general view of the circumstances which dispose to rheumatic attacks and rheumatic disorders, which he represents to consist chiefly in atmospheric vicissitudes, constitutional predisposition, hereditary peculiarities, and the early period of adult life. He allows, however, that, at different periods of life, different forms of rheumatic disorder are liable to prevail. He notices shortly the endeavours made by anatomists to fix upon some centre of the fibrous system, and in speaking of the tendency shown by rheumatic attacks to affect the heart, treats with little favour the notions of Dr Godman, who maintained rather strongly the proposition, that the pericardium is connected with the superficial fascia of the neck, by being prolonged upwards over the large vessels. Upon these points we think the chief error committed consists in supposing that one membrane can give rise to another, or that rheumatic inflammation necessarily and uniformly always affects one and the same species of tissue. If it be merely admitted that membranes or their parts are continuous with each other, the transitions of rheumatic sensations and rheumatic action, in whatever these consist, seem to be quite intelligible. But while this may be sufficient to account for rheumatic disorder attacking the external or fibrous portion of the capsular pericardium, it certainly does not furnish any reason why it should suddenly fix itself in the serous or inner surface of the pericardium, which it most usually does ; neither does it account for the transition of rheumatic inflammation to the endocardium or lining membrane of the heart, in which it is known often to appear in the course of rheumatism of external parts.

These circumstances are rather favourable to the inference, that rheumatism must be regarded, not so much as the inflammatory action of a particular tissue, as a particular sort of inflammation affecting different tissues and affecting them all in different modes and with different effects. Thus in some instances it affects the investing and intermuscular fascia, in other instances, the articular tissues, in others the periosteum and the fasciæ connected with that membrane, and in others the serous membranes of the cavities, the lining membrane of the heart, the womb or its substance, the sclerotic coat of the eye, and the neurilema or investing membrane of the nerves.

Though Dr Macleod does not expressly adopt this view, yet he virtually and substantially does so; since he distinguishes rheumatism into that which affects external parts and that which attacks internal organs. The rheumatism affecting external parts he distinguishes into five varieties.

1. The first is *Rheumatic Fever*, in which the patient is attacked with pain in one or more joints, spreading more or less over the surrounding parts, with swelling external to the joint, with rapid shifting of the articular pains, and acute inflammatory fever.

2. The second is *Arthritic or Capsular Rheumatism*, distinguished by less redness of surface, pain more limited; swelling dependent on effusion within the capsule; affecting also sometimes the bursæ; and less violent fever than in the former variety. The merit of distinguishing between these two forms of the disorder, Dr Macleod assigns to Dr Chambers.

3. The third variety is the *Chronic or Muscular*, in which the pain is referred chiefly to parts intermediate between the joints, apparently the muscles or their aponeurotic coverings. The pain, though excruciating on motion, is often absent when the parts are quiescent, and there is little or no constitutional disorder.

4. In a fourth variety, designated as the *Periosteal*, the disease affects the coverings of those bones which are most thinly covered and most near the surface, as the tibia, the ulna, or the cranium, with painful patches or spots tender to the touch and elevated into nodes.

5. The fifth and last variety is that named *Neuralgic*, in which the pain follows the course of particular nerves, especially those of the lower extremities, and is confined to a line traceable by the finger.

These varieties of the disease, the author describes with much accuracy in the subsequent chapters of his work, and gives an instructive view of the peculiar characters belonging to each. In these descriptions, the author observes the order now marked in enumerating the several species of the disorder.

I. In his account of rheumatic fever, though he allows that the ligaments and the other white dense fibrous tissues are the primary seat of the disease, he thinks it clear that to these the inflammation is not confined; and he considers the redness of the skin and the subcutaneous effusion as proof of the affection of that membrane.

Though opportunities of inspecting the state of the parts affected in acute rheumatism are of very rare occurrence, Dr Macleod has in two instances been able to examine the state of the parts previously affected; and in these he observed that "the redness had subsided, and the swelling was much reduced, so that nothing remained but a certain portion of serum or serum and lymph in the subcutaneous cellular membrane. The fibrous tissues were perhaps rather thicker than natural, but without redness; the synovial membranes were without any apparent participation in the disease."

Chomel also states that, in a patient who had laboured under severe affection of the joints with much swelling, and who had been speedily cut off by pericarditis, the examination of all the articulations disclosed in none of them the slightest trace of inflammatory action.

These circumstances lead Dr Macleod to infer that, in the first form of the disease, though the inflammation frequently extends both to the integuments and to the deeper seated structures, yet it is a kind of inflammatory action little prone to disorganization; and he thinks that it is only in cases where the synovial membrane is implicated, viz. the second form of the disorder, that permanent injury is done to the articulations.

Besides the joints of the foot and ankle, the knee, the hands, and wrists, the shoulders and elbow, in the order now mentioned, rheumatic inflammation may affect the scalp and the parietes of the chest and belly. The affection of the scalp, however, he allows to be more common in other forms of the disease, and in our experience, we must say that it is most usual in the chronic forms of the disease, though we are unable to say whether it affects the cranial aponeurosis exclusively, or the pericranium, or both together.

Rheumatism of the intercostal muscles and their aponeurotic slips, the bastard or spurious pleurisy of practical writers, is important chiefly from the chance of its being confounded with true pleurisy.

Rheumatism of the diaphragm, which Dr Macleod has sometimes supposed to be present from the manner in which the pain darted from the sternum and margins of the ribs to the back and loins, he thinks, however, is a rare occurrence, and rather a matter of curiosity than of practical importance. We have, nevertheless, observed the disease several times, and can say that, though always amenable to treatment, it is a severe and excruciating form of the complaint.

The author thinks that he has seen several instances of rheumatism of the *tunica albuginea testis*, indicated by acute pain in the testis coming on suddenly, with great tenderness and increased heat, but without swelling, in persons subject to rheumatism, (p. 20). It is quite possible, we believe, for any organ to become affected with rheumatism, more especially, if it contain or be composed of fibrous tissue; and the testis may in the same manner, and for the same reason, be liable to this disorder. But it appears to us that the complaint now referred to, is more of a neuralgic than a pure rheumatic nature. We have often seen in persons of rather sedentary habits, and in whom the bowels were tardy or liable to constipation, a most acutely painful disorder of the testis,—imitating, as to the severity of the pain and its weakening influence, that of inflamed testis, but altogether without swelling,—with some heat, great tenderness and pain ascending to the loins. This excruciating complaint we have traced distinctly and unequivocally to great distension of the spermatic veins, causing painful stretching of the multiplied spermatic nerves which accompany the blood-vessels to the gland. The distension of the veins is caused either by the pressure of feculent matter in the sigmoid flexure of the colon, or in the rectum, or by that of air in the same bowels, impeding the return of the blood; and while the disorder comes on suddenly, it often disappears with equal rapidity, after the efficient operation of a dose of laxative medicine, or the expulsion of air from the bowels. We think it scarcely possible to doubt that this pain is caused by the stretching of the nervous branches in the manner now explained.

Acute rheumatism is a disease essentially and decidedly inflammatory; and it might be inferred accordingly, that it ought to be treated by decided and efficient antiphlogistic remedies. Yet, observes Dr Macleod, there is scarcely a disease with respect to which the treatment recommended by different authorities is so various and contradictory. Nor does he think this can be altogether explained by the term being applied to forms and conditions of disease widely different from each other. One party, indeed, recommends blood-letting very strongly; and another is opposed to its use, and regards it as productive of great evils. But we shall not dwell at present on this subject, which has been on former occasions considered at sufficient length in the pages of this Journal.

Dr Macleod, in considering the arguments in favour of, and the objections against, the use of blood-letting, very properly directs attention to the two facts, that, in order that blood-letting be really beneficial in acute rheumatism, it must be employed early in the disease, and carried to a sufficient extent. To this conclusion he appears to have been led only by successive and gradual steps. The following observations show the train of reasoning adopted.

"Many assume not only that free blood-letting is injurious, but that acute rheumatism can never be cut short by it. Now I suspect that of those who give a tolerably confident opinion upon this point, very few have tried the method they condemn. In the winter of 1834, a patient labouring under acute rheumatism was brought into St George's Hospital; he presented great tumefaction and redness of the left hand and wrist of only thirty-six hours' duration. I had been in the habit of bleeding in cases such as this to the extent of from twelve to sixteen ounces, and following up the depletion with calomel and opium; but a very intelligent young physician then attending the hospital having stated that he had seen his father often cure acute rheumatism very rapidly by copious venesection, without any thing else, I ordered the patient above alluded to to be largely bled (to thirty ounces), and no medicine to be given internally. In this case, the disease was literally extinguished, for the patient was at once entirely relieved of his pain, and the swelling rapidly disappeared. Now it is only in that form and stage of the disease, of which the case alluded to may be regarded as a type, that blood-letting exercises such remarkable influence, and it is in such cases only that I urge the expediency of bleeding and purging, as in any other acute inflammation, and with the same object, namely, that of at once cutting short the disease. In a certain number of cases we shall succeed in the accomplishment of our purpose just as completely as in any other form of inflammation; and even when we fail to arrest the attack entirely, we mitigate its severity, and render it more amenable to other remedies.

"To come more to particulars, I should say, that in well-marked cases of rheumatic fever, within the first week of their onset, and in individuals of the average degree of robustness, from twelve to twenty ounces of blood may be abstracted with advantage, several successive times, in the course of five or six days. In judging of the propriety of repeating the venesection, the three points chiefly requiring to be attended to are the state of the blood, the character of the pulse, and the effect produced upon the rheumatic pains."—Pp. 31–33.

With this Dr Macleod conjoins active and systematic purging by means of calomel at night, followed by the saline infusion of senna in the morning. This method of treatment, we are happy to see thus strongly and judiciously inculcated, and we can add our own testimony to its efficacy, both in abating the severity of the articular pains, and also in greatly abridging the usual course of the disease. The more actively, indeed, the two sorts of remedies now mentioned are employed in the early stage of the disease, the more complete will be the relief afforded, and the more speedily will the patient be restored to the use of his limbs. Another important consideration ought also to have great weight in pursuing the method of treatment now mentioned, that other remedies usually employed are either altogether superseded, or are rendered much less requisite. Thus the whole tribe of the anodynes, narcotics, diaphoretics, tonics, and revellents, and local remedies, are rendered totally unnecessary, or at most, their employment is very much abridged.

These statements we make not on slight or limited grounds of evidence. We have employed the method of treatment by blood-letting and active catharsis for at least twenty years in public and private practice, and we never saw it productive of any other result but much earlier removal of the disease than by any other method. We have seen it even necessary and beneficial to have recourse to large blood-letting in the chronic or subacute forms of the distemper, though the pulse was not above 80; and, indeed, it does not answer to trust to the frequency of the pulse alone in the treatment of rheumatism, as the character of the pulse, with the severity of the pains, and the state of the skin and tongue, forms a much safer guide to the physician.

It is curious to observe how prejudices arise and acquire strength against the use of various remedies; and of these the use of blood-letting and the exhibition of cathartics in the treatment of rheumatism affords an instructive example. In the hands of Sir John Pringle and Dr Donald Monro, the former was an efficacious remedy. But Fothergill had been led to think that blood-letting and the evacuating system was in the relaxing atmosphere of London hurtful by protracting the disease, and inducing, as he imagined, a fatal termination. He had not yet learned that rheumatism, by attacking various internal organs, especially the heart, is liable to terminate fatally, whatever be the mode of treatment adopted. In this fancy, the offspring of imperfect observation, he was much abetted by Sir Samuel Hulse, and he was afterwards followed by Fordyce and Willan, (1800,) the former of whom confidently, but without any good reason, ascribed to the use of blood-letting, the metastasis to the internal organs. Fowler had some time previously, (1795,) subjected the remedy to experimental trial in 41 among 87 cases; and the results were not favourable. But we think it not wonderful that they were not; since the amount drawn rarely exceeded eight or ten ounces, and was positively limited to twelve ounces. When, indeed, blood is drawn in so small quantity, it cannot be expected to make any impression either on the system or on an inflammatory disorder like rheumatism, and it merely impairs the strength, without diminishing in any degree the violence of the symptoms. These views on the inutility or the detrimental effects of blood-letting as an anti-rheumatic agent were greatly strengthened by the testimony of Dr Haygarth, whose Clinical History, published in 1805, was intended principally to recommend and illustrate the therapeutic virtues of Peruvian bark. This physician employed venesection in the early part of his practice; but after he began to prescribe cinchona, he appears to have either employed it very rarely, or to have given up its use altogether. But, even at the time when he was in the habit of employing venesection as a remedy, the mode in which he did use it was liable to the objection already stated against Dr Fowler's use of the remedy. The usual quantities drawn were 6, 8, 10, and 12 ounces, most commonly 10 ounces; 16 ounces appear twice, 20 ounces appear once, 24 ounces once, and 36 ounces once in his tables; and as the tables proceed, the remedy gradually diminishes in frequency till it entirely disappears. Yet the major part of his patients were persons between 15 and 20, 20 and 30, and 40 and 50 in point of age.

While such was the light in which venesection as a remedy was beheld by many physicians in London and the large towns, it is remarkable that it was carried to a very great extent by the physicians of Bristol and Mr Bedingfield of the same city. That gentleman published in 1816 a small but useful Compendium of Medical Practice, in which he showed that the only effectual method of curing acute rheumatism was by copious blood-letting, and the use of active purgatives; and that when these measures were neglected, and other means employed, metastasis to the heart often took place. The observations of this author are so important and so pointed, that we must place them before our readers, as we were not aware, till the publication of the present work, that they were so little known.

" A great number of cases of acute rheumatism," says Mr Bedingfield, " are annually admitted into this hospital (the Bristol Infirmary.) Nothing has been found so effectual for their relief as copious venesection. When twenty, thirty, or forty ounces of blood have been taken away for three or four days in succession, cases of the most violent description have been very speedily cured. Cases of the same description treated with antimonials, the compound powder of ipecacuan and other sudorifics have been as generally very slow of recovery; and it not unfrequently has happened that there has been a metastasis of the disease to the heart." Compendium, Chap. v. p. 307. To these suggestions, however, little attention appears to have been given; and we have no doubt that to many the Compendium of Mr Bedingfield is still wholly unknown.

In the meantime a new argument against the propriety and the safety of blood-letting had been brought forward in the supposed production of metastasis to the heart and internal organs. This notion, which was first started by Dr Fordyce, was more decidedly supported by Dr Wells; and, indeed, since his time it has been maintained more or less confidently by several physicians, first in London, and afterwards in Edinburgh. In maintaining this view, however, it appears that no serious attempt had yet been made to ascertain whether it was founded on fact or not; whether it was matter of fact that, in the cases of translation, blood-letting had or had not been used; and whether, when the remedy had been used and carried to sufficient length, metastasis had ensued. Mr Bedingfield, indeed, had stated in strong, clear, and unequivocal terms, the result of his own observation, and that of the physicians of the Bristol Infirmary, when he said in 1816,—" The metastasis of rheumatic inflammation from the extremities to the heart often gives rise to it, (increased inordinate action of the heart and arteries), particularly when venesection has been omitted, or but sparingly employed." But, as we have already said, his warnings appear to have been either unknown or altogether neglected. Very similar is the testimony of Dr Cox, who published in 1824 Observations on Acute Rheumatism, and its Metastasis to the Heart, and who appears to have considered this subject with much attention. This author, who is the first that gives, next to Sir David Dundas and Dr Wells, a systematic account of the metastasis of rheumatism, and whose descriptions are manifestly taken from personal observation, gives little encouragement to the view now mentioned. " It has been contended," he says, " that general blood-letting disposes to this metastasis; how far the opinion may be the result of experience or speculation, I must confess myself unable to decide, it having never fallen to my lot to witness one instance of this occurrence, which could, without hesitation, be referred to such a cause. On the contrary, they have been either referable to the too cautious abstraction of blood in the commencement of the disease, or to the entire omission of such a practice. And symptoms of inflammation of the pericardium sometimes precede, or are simultaneous with the rheumatic affection of the joints, prior to the employment of any measures for the cure of the disease." P. 47 and 48. A view quite similar is given at a period long subsequent, by Dr Craigie (Elements, Vol. ii. p. 675) as the result of observation in cases, in which rheumatism had been accompanied or followed by pericardial inflammation.

Upon this subject we are happy to find that the experience of such observers as Dr Watson and the present author is quite the same as that now stated. The following observations by Dr Macleod contain a good view of the kind and amount of the evidence at present attainable on the question.

" I am not aware," says Dr Macleod, " that any circumstance has been specified as tending to produce the pericarditis in such cases, except blood-letting, which has been supposed to increase the risk of this occurrence. So far as my observation extends, this opinion rests on insufficient grounds. I have, during some years, often bled patients freely and repeatedly in the course of the first week in rheumatism, without as yet having met with one instance in which inflammation of the heart has been induced by it; and I have seen many cases of rheumatic heart in which the patients had never been bled at all. At Edinburgh, some years ago, blood-letting was practised to a great extent in the clinical wards of the Royal Infirmary; and Dr Watson, who witnessed the treatment, says, in reference to it, 'I do not recollect that affections of the heart were much noticed in those cases.' Again, blood-letting has scarcely been employed in France in the treatment of rheumatism, and yet, as we have seen above, M. Bouillaud, alluding to the frequency of the complication of pericarditis, regards its presence as the rule, and its absence as the exception—a view of the subject which clearly proves how common it is in Paris. And this inference, be it observed, he draws, not from those who had been bled, (which his own patients generally were very freely,) but from those treated in the ordinary way.

"I cannot help thinking that the idea originated in an erroneous theory, and has since been perpetuated by that strong tendency to copy opinions and practice which is so remarkable in the history of our art. Patients having severe fibrous rheumatism were bled; some of them afterwards became affected with pericarditis: the fact of this being so frequent an accompaniment of rheumatic fever was not known, and some extraordinary cause being thought necessary to account for the phenomenon, the blame was charged upon the depletion. But again, the pericarditis not being recognized as one in the train of phenomena in acute rheumatism, was supposed to be a transference of the disease from the external parts to an internal organ—a metastasis, in short; and then, by a natural train of reasoning, those causes which experience had shown to lead to other kinds of metastasis were assumed to operate similarly here. I believe that this view of the pathology of the affection of the heart which takes place in rheumatism will be found to pervade the writings of all those who hold that blood-letting in rheumatic fever tends to produce pericarditis. Thus, Dr Alison, in his History of Physic, published in the fourth volume of the Cyclopædia of Practical Medicine, says he has no difficulty 'in stating his conviction, that large and repeated bleedings in the beginning of rheumatism, increase the risk of this *metastasis.*' No ground, however, is assigned for this conviction; and it would clearly require, in order to prove its accuracy, a great number of comparative trials, made in cases as much alike as possible. Again, I have stated above, that, so far as my experience goes, the complication of the heart affection is more apt to occur in severe than in slighter cases; but it is in such severe cases that we most usually abstract blood; and then those who enter upon the subject with preconceived opinions, almost unconsciously dwell upon the depletion, and forget the acuteness of the disease which called for it, when they are seeking out the causes of pericarditis.

"If there be one class of patients more than another in whom blood-letting is comparatively seldom adopted in acute rheumatism, it is children; and what is the fact with regard to *their* liability to heart affections? Are they proportionally more or less obnoxious to this disease? I have no hesitation in affirming, that I have met with more cases, proportionally, in which rheumatic fever had led to disease of the heart, in children than in adults. This remark is also in keeping with the experience of Dr Watson, who says, that although blood-letting does not cause any predisposition to the cardiac affection, yet youth certainly does; and further, that the younger the child is, the more likely is rheumatic pericarditis to supervene. Now, agreeing as I do with Dr Watson in the statement of the fact, I venture to ask, with regard to its cause, whether this may not consist in that, the younger the patient, the less likely is the necessary depletion to have been had recourse to?

"Lastly, as regards this part of the question, let us observe the treatment. A patient has rheumatism of the limbs, and it is assumed, that to bleed him increases the risk of his heart becoming affected. But if the heart does become implicated, although the rheumatism still remains in the limbs, we are then told to bleed (moderately it may be, but still to bleed), by the very same parties who hold that to bleed in rheumatism increases the risk of the heart becoming affected? But if bleeding originally transferred a portion of the rheumatic action to the heart, surely bleeding further must be attended with the risk of transmitting any portion of the disease which yet remains in the limbs, to that organ whose liability to it was first begotten by the depletion.

"That blood-letting carried too far, in rheumatism, is productive of certain other injurious consequences, I feel persuaded; but nothing I have seen would lead me to enumerate pericarditis among those evils: and this, I may add, is an opinion forced upon me in the wards of St George's Hospital, in opposition to the opinions I had previously derived from reading."—Pp. 46–50.

Upon the whole, we think that the proposition that blood-letting in the treatment of acute rheumatism disposes to, and induces pericardial inflammation, is not only absurd and inconsistent in theory, but is at variance with every thing hitherto ascertained in practice.

To the use of opium given after due depletion especially, Dr Macleod is favourable. The solid preparations of the drug, he properly adds, are more suitable than the liquid; and though he mentions two grains in the twenty-four hours as the average quantity, yet to this he does not limit the amount to be given, but extends it to four or six and eight grains in that space of time, in short, to the extent of alleviating pain. It is further not the mere amount given in twenty-four hours that is requisite to be attended to, or the relief for pain afforded. It is often of moment to give the drug for three or four days in this manner, until the symptoms be removed, or very considerably subdued. Thus, we have found it requisite to exhibit six grains for three successive days before the symptoms of the disease were entirely removed.

The great point, however, we believe, to be previous and concomitant depletion, and evacuation from the intestinal canal.

To the union of calomel with opium, he is less indulgent, having frequently observed the rheumatic symptoms to persist after the mouth was affected. He allows, however, that it should be immediately administered where there are indications that the heart is affected.

The exhibition of cinchona he decidedly condemns in the treatment of acute rheumatism, because, he adds, it is often observed when exhibited, even when the symptoms are declining, to induce a return of the distemper, and a manifest aggravation of all the symptoms. It is only, he adds, in old cases occurring in cachectic and broken down constitutions, that cinchona is sometimes of essential service.

Dr Macleod considers next the affections of the internal organs taking place in acute rheumatism, and first that of inflammation about the heart, or in its constituent tissues. He very properly claims for British physicians the merit of having first recognized this connection and transition, which it is known from the paper of Sir D. Dundas, first published in 1808, took place previous to the close of the eighteenth century. It is clear that it is quite absurd to imagine that M. Bouillaud is entitled to the merit of this discovery. The fact of *pericarditis* and hypertrophy, and disease of the valves taking place, along with, or in consequence of rheumatism, has been long known in this country, and admitted among well-informed physicians, as an established principle in pathology. If no other evidence on this point could be adduced, that of the 20th case detailed by Mr Bedingfield at p. 141–144, is quite conclusive. In one circumstance is the merit of M. Bouillaud conspicuous; and that is, in maintaining, and perhaps in showing the frequent if not the uniform presence of inflammation of the lining membrane of the heart in acute rheumatism, and in converting this into an individual disease under the name of *Endocarditis.* It must be further admitted that M. Bouillaud has certainly investigated more fully, and illustrated more amply, the relations subsisting between rheumatism and disease of the heart, especially of its lining membrane, than any other physician.

All this is admitted by Dr Macleod, who has further seen reason to infer that, while instances of disease of the heart are very common, most of these have in the first instance received their original impulse from the presence of an attack of acute rheumatism. Dr Macleod further observes that the affection of the heart or its membranes appears to be rather improperly regarded as an instance of metastasis. It is rather a simultaneous or co-existing disorder, and often an extended form of the disease. Were it metastatic, it ought to appear when the rheumatic disorder subsides.

Most usually, however, when it takes place, the external pains are by no means mitigated; and in others he has seen persons, in consequence of exposure to cold, affected with symptoms of pericarditis first, and then after the interval of twenty-four or forty-eight hours with unequivocal symptoms of articular rheumatism.

In the ensuing chapter, viz. the fifth, is given a correct and instructive account of the symptoms produced by the presence of pericarditis, and those caused by more or less change in the valves.

Though the stethoscopic and physical signs are in this case highly important, yet other symptoms should not be neglected; and of these none are more important than the aspect, expression, and physiognomy of the patient.

"Of the general symptoms," says Dr Macleod, "which indicate that the heart has become implicated in an attack of acute rheumatism, the most striking is the aspect of the patient. I venture to say there is no observant practitioner who has not had occasion, on going into the wards of an hospital, to stop at once on coming to a rheumatic patient whom he may have seen the day before apparently doing well, and proceed to examine the heart with the conviction on his mind, before he has asked a single question, or applied his stethoscope, that carditis has supervened in the interval. This is one of the many instances in which the eye can detect what the pen cannot express. The system has taken the alarm at the new inroad of the malady; the consequent distress is depicted in the countenance, and told in every attitude and every movement. The expression is anxious; the breathing rather shallow; occasionally there is cough. The patient is sometimes very restless, but more generally lies on the back, or right side; at least it is rare to see him choose the left. Here we have intense fever, but for the most part without the restlessness and tossing that usually attend that state. Indeed there is occasionally a fixedness in the general aspect—I had almost said in the deportment of the patient—quite remarkable; he becomes, as it were, passive, and while the immobility with which he retains one position would lead us to suppose that any other would be intolerable to him, yet I have known such a patient, upon being removed, remain in his new position apparently as determinedly as he had previously done in the other. Although, therefore, reclining on the back, or a little to the right, be the most common, and therefore, we must presume, generally the easiest posture, yet the unwillingness to move, even to resume this attitude, probably depends upon the effect produced by motion of any kind on the heart's action, which thus becomes for the time still further embarrassed. In the cases where this unwillingness to any change of posture is most marked, the action of the heart is usually feeble, and the sounds indistinct. Dr Latham, who has excellently described this phenomenon, attributes it, and probably with justice, to the presence of fluid effusion in the pericardium. And here I may observe, that where copious effusion takes place rather rapidly into the pericardium, unaccompanied by hydrothorax, the patient will sometimes prefer to lie perfectly flat on the back, without having the shoulders raised at all; being just the reverse of what we are almost invariably taught in books. Such, at least, has been the fact in several cases in which I had an opportunity of examing the bodies, and in others where the patients recovered, after having had symptoms which led me to believe that there had been fluid in the pericardium.

"Where the peculiar anxiety of countenance above-mentioned, and the reluctance to change of posture, are most marked, there will also frequently be seen a disposition to syncope. I say a disposition to this state, because I think the patient very rarely does actually faint. The pulse, too, becomes unsteady, and varies in the character of its beats, but rarely has any considerable power. There is heat of skin and thirst, and furred tongue, and sluggish bowels, and high-coloured urine, and all the usual symptoms of inflammatory fever.

"Now when either all, or several of the phenomena above described, occur in course of a case of acute rheumatism, there cannot be any difficulty in detecting the nature of the complication which has added to the severity of the primary attack; there can scarcely be room for hesitation in declaring pericarditis to be present."—Pp. 59, 61.

Besides the symptoms now mentioned, in some cases the pericardial disorder is attended with a peculiar sort of delirium or absolute insanity, the brain itself remaining without marks of lesion. From two cases given by the author, the attack appears to have been of the nature of *delirium tremens*. Delirium dependent on true inflammation of the brain, he thinks, is in all cases connected with synovial rheumatism, the capsular or arthritic variety of the distemper.

The effects of rheumatic inflammation of the heart are ably described; but, as these are sufficiently well known, we must refer our readers to the volume itself.

The treatment recommended to counteract these changes, if they can be recognized in season, consists in blood-letting and the employment of mercury. The author recommends, however, that more caution should be observed in the abstraction of blood, when the heart is affected than in simple rheumatism, because the system is less capable of enduring a considerable evacuation without causing syncope, which is in general to be avoided. The effects of general depletion, however, may be aided by local depletion, and, above all, by the use of mercury, to aid in preventing effusion and promoting absorption if possible.

II. The second form of rheumatism, the capsular or arthritic, is seated in the lining membrane of the joints and bursæ; and hence it bears some resemblance to gout, to which the author represents it as being closely allied.

"The parts most liable to its attacks are the feet and hands, where it is, for the most part, easily recognized by the enlargement of the joints; but the peculiar characters of the disease are, perhaps, most strikingly displayed when it attacks the knee. At first there is pain and heat, which, in the more severe cases, are attended by external redness; and after a time, varying from about twenty-four hours to several days, tumefaction of the parts takes place. The appearance of the swelling, which is limited to the immediate vicinity of the joint, points out the nature of the affection. The effusion is within the synovial capsule, which is consequently distended, and projects at those points where it meets with least resistance. This gives a peculiarity to the shape, which at once strikes the eye. In the knee, the fulness is most conspicuous on either side of the patella and across the lower part of the thigh, just above the joint: frequently also it projects backwards, and may be seen or felt between the hamstrings. Even where the inflammation extends to the surrounding textures, they participate much less in this than in the preceding form of the disease, and the swelling is consequently much less diffused. In the synovial rheumatism the swelling is fluctuating, and bound down by the ligaments of the joint: in the common acute rheumatism, the effusion is external to the capsular ligament —chiefly in the cellular membrane—and does not fluctuate. The shape and aspect of the two thus differ strikingly from each other, and only require to be seen in order to be afterwards recognized without the least difficulty, unless there be something very unusual in the case.

"Nor are the histories of the two diseases less remarkable for their points of difference. The capsular rheumatism is infinitely more persistent—affecting, for the most part, several joints, but generally becoming more especially fixed in a limited number, to be ultimately completely localised, and in a certain proportion of them to produce permanent changes of structure, or even disorganization of the parts. In general, it is probable that the effusion into the joint consists merely of an increased quantity of synovia, produced by the excited condition of the secreting surface."—Pp. 92, 94.

"When the disease recurs several times, the recovery after each attack becomes less and less complete: the joint remains perceptibly swollen; the ligaments which bind the extremities of the bones together are stretched; the relative situations of the articulating surfaces are altered, and more or less distortion is the result. Sometimes the quantity of synovia in the joint becomes permanently, though not very considerably, increased, the disease assuming an entirely chronic character; and in several such cases, where I have examined the joints after death, I have found little or nothing which could be called disease, with the exception of a preternatural quantity of synovia. In others, the synovia, which, during the acuter attacks, had become increased in quantity, is again absorbed as these subside; but about such joints, particularly after repeated attacks, some degree of thickening remains. This is most remarkable in the small joints, particularly those of the fingers and toes, which are often considerably distorted by it; and when, as sometimes happens it extends to the larger joints also, it is difficult to imagine any thing more helpless than the subject of such disease ultimately becomes. Fortunately it has almost invariably a chronic character, and is attended with comparatively little pain. This is what Dr Haygarth described, many years ago, as nodosities of the joints, but apparently without fully understanding its nature."—Pp. 94, 95.

When the disease has recurred several times, or persisted long, the cartilages are covered or penetrated by a pulverulent deposit, which Dr Chambers found to consist, in the cases examined by him, of carbonate of lime, but which Dr Prout and the present author represent in their experience to be lithate of soda, the same substance, in short, which constitutes the chalk stones or concretions of gout. This seems to be one mode of termination.

Another more extraordinary is that of suppuration within the capsule, and the consequent disorganization of the joint. The author allows that he has never seen any other form of rheumatism except this terminate in suppuration; and he adduces, in confirmation of the accuracy of his statement, four cases which fell under his own management, in three of which the appearances were ascertained by dissection, a fifth case from the work of Sir Benjamin Brodie, and a sixth from the Journal Hebdomadaire for April 1834.

The appearances found in all these cases were, matter more or less abundant within the joint and around it, redness of the inner surface, ulceration of the cartilages, and death or lacerative destruction of the ligaments. These appearances are exactly those which take place in common phlegmonous or strumous inflammation of the articular tissues, acute, subacute, or chronic. Are we therefore to regard them as the effect of rheumatism or of common inflammation of the joints? If the former, it is probable that they assume this destructive action under some peculiar morbid influence, such, for instance, as the strumous diathesis. Dr Macleod entertains no doubt that these cases are genuine examples of rheumatism; and it is possible he may be in the right. But it must, notwithstanding, be observed, that rheumatism is never, in other circumstances, known to terminate in suppuration, and, conversely, many cases which have been first mistaken for rheumatic have afterwards been admitted to be genuine inflammatory or phlegmonous affections of the articulations; and, indeed, when inflammatory attacks in the articulations indicated by pain, swelling, and increased heat, terminate in suppuration, that very circumstance has been hitherto generally, if not uniformly, regarded as proof, that the disorder was not of the nature of rheumatism. Finally, by what tests or pathognomonic characters is rheumatism to be distinguished from common phlegmonous, or strumous inflammation of the joints?

These difficulties have been suggested to us by the facts detailed in the volume before us, and they will doubtless be suggested to the minds of others in the same circumstances. It must be added, that they do not amount to a denial of the sort of rheumatism here described as capsular by Dr Macleod, the existence of which we fully admit, and have often seen and treated. They merely throw certain doubts upon the propriety of referring to the same head with rheumatism, those cases in which suppuration has taken place within the joints, and the cartilages have been ulcerated with or without destruction of the ligaments. It appears, in short, doubtful whether a disease terminating in suppuration and ulceration of the articular tissues should be regarded as rheumatic.

While Dr Macleod impresses the possibility of the mode of termination now mentioned, we do not observe that he makes mention of another lesion of the articular tissues, in which we think experience shows the capsular or arthritic rheumatism is liable to terminate. This consists in the eburneoid or ivory-like transformation of the intra-articular cartilages. In this change the cartilages of the hip-joint, knee-joint, or elbow-joint, are covered or penetrated with a sort of matter quite like ivory, arranged in amorphous patches over those parts of the articular ends of the bones where motion is most multiplied and extensive. Thus the inner surface of the acetabulum or one of its sides, the articular head of the femur, the most prominent part of the condyloid processes of the femur, or the articular head of the tibia, or the trochlear extremity of the humerus, may be covered with such patches, not very thick, but thicker at the centre than at the circumference. The free surfaces of these patches are totally void of synovial membrane, which, indeed, seems first to be worn off, or not to be repaired, as it is destroyed by the process going on within the joint. The cartilages also seem in some instances to be worn off; at least the greater part of them at the most prominent points of the articular surfaces can no longer be recognized. The ivory-like matter is then deposited in the place of these two textures, and performs, though not very perfectly, the functions which they executed in the motions of the articulating surfaces. In this service also the new deposit is ground or worn, so that it often presents the aspect of ivory which has been turned, ground, or polished.

This lesion we have seen in the hip-joint, the knee-joint, the elbow-joint, and in the wrist and ankle-joints.

Capsular or synovial rheumatism, Dr Macleod shows, is most commonly associated with, if not dependent upon, an impaired state of the general health, occurring chiefly in the feeble, and when it takes in those of robust constitution, it is under the influence of such causes as impair its vigour; for instance, mental or bodily exhaustion, severe study, acute distress, long journeys in cold weather, and night-watching. It is also the form of the disease which takes place in those affected by gonorrhœa, and sometimes follows the use of mercury.

"The first indication of this form of rheumatism generally consists in a dull aching and stiffness of certain joints, particularly those which are most superficial. After a time the pain becomes of a more acute or burning character, and the parts begin to swell, the enlargement presenting a model of the synovial or bursal cavity, into which the effusion has taken place: the suffering is increased either by stretching the parts much, or by corrugating them, and hence a semi-flexed position of the joint is the one usually assumed in severe cases. Motion aggravates the pain, particularly after rest of some continuance, as in the morning, at which time there is often a great deal of stiffness about the parts; but in chronic cases this subsides after a little exercise, and the limb assumes more of its wonted suppleness.

"In the most acute cases there is smart fever, and some redness about the joints; but much more usually there is no external discoloration, and little fever; at least the fever is inconsiderable as compared to that which attends the form of rheumatism first described. When fever is present to a considerable extent, it generally presents the remittent type, with copious perspirations; and I have seen a pulverulent deposit on the skin, which admitted of being scraped off, in quantity minute indeed, but sufficient to admit of being tested, and which was found to consist of the lithate of soda. Where the fever runs rather high the tongue becomes loaded and the bowels constipated; but there is much less disposition to these states than in common rheumatic fever. Indeed, of the secretions, the perspiration and urine are those most uniformly affected, the latter being charged with the lithates, and sometimes producing a sense of scalding as it is voided."—Pp. 109, 110.

This form of the distemper runs a course of from three to six weeks. But it is liable to recur; to become chronic; and then it lays the foundation of the tumours called nodosities of the joints; or, as already stated, it may terminate in wearing of the synovial membrane and cartilages, and the eburneoid deposit, as a compensating texture for that which is destroyed. In the latter class of cases, the use of the joint is more or less impaired. In some cases it seems to terminate without leaving after it bad effects, and the patient enjoys good health for many years, apparently not in consequence of any medical treatment employed.

This form of rheumatic distemper betrays little disposition to affect the heart; but it occasionally attacks the pleura or the membranes of the brain, by a metastatic action, and then is often unmanageable and even fatal. Inspection then discloses marks of inflammation of the arachnoid membrane and *pia mater*, with occasionally superficial softening of the convolutions, and more or less fluid effused within the ventricles. Patients die in this case paralytic, semicomatose, and blind.

Dr Macleod thinks that it is in the same variety of rheumatism that the eye is liable to be affected, but adds, that it is not so common as surgical and ophthalmological writers represent it to be; and, if we understand him right, he regards it as not so much a rheumatic form of inflammation, as an inflammatory attack affecting the eye, from the same cause, viz. exposure to cold, which produces the rheumatic attack. This is perhaps a correct view of the relation of these two events in many circumstances. But we must observe, that, in persons who have been affected with gonorrhoea, or who have taken mercury, it is very common in this country to see a very violent inflammation of the sclerotic coat developed, and when neglected at first, or treated by lotions and similar inert remedies, on the idea that it is common ophthalmia of the conjunctiva, it proceeds, not rapidly or steadily, but slowly, and with various oscillations in its phenomena, till it first renders the aqueous humour turbid, and then shows that it has firmly and decidedly fixed on the iris. It is in this stage very difficult to be displaced, and is not displaced without copious depletion, general and local, and revellents and derivatives. If, however, it be opposed, previous to the attack on the iris, by active and prompt depletion, it is always amenable to treatment. In the event of its not being actively opposed previous to the iris being attacked, the latter membrane is shrivelled by inflammation, the pupil becomes irregular and fixed, and, as a proper organ of vision, the eye is lost.

The proper treatment of capsular rheumatism consists in local bleeding by means of leeches, repeated according to circumstances, tepid spirituous embrocations, anodyne, local applications, the internal administration of meadow-saffron, and afterwards of the iodide of potassium.

III. To the head of muscular rheumatism, Dr Macleod refers those chronic pains, generally without fever, which affect the muscles, moving the large joints as the hip and shoulder, lumbago, and pleurodyne, or the bastard pleurisy.

For the removal of this, the most suitable remedies he regards to be local depletion by means of cupping, the use of purgatives, the exhibition of the ammoniated tincture of guaiacum, the oils of turpentine, and cajeput, the balsams of copaiva and Peru, the warm-bath, and the hot vapour-bath, acupuncture, and electricity.

IV. The neuralgic rheumatism comes next; and to this head the author refers sciatica, or the hip-gout, and some forms of *prosopalgia* or face-ach.

For the removal, or at least mitigation of this form of the disease, he recommends at first depletion from the loins by cupping, blistering along the course of the affected nerve, and then the use of such narcotic agents, as stramonium, aconite, and veratria. Of the stramonium and its efficacy, he speaks not very favourably. Aconite he recommends in the form of tincture of the root, rather than in that of extract; and begins with five minims three times daily, increasing it gradually to twelve minims, which is the largest quantity he has given. He also applies it externally by means of a hair pencil.

In speaking of the extract of aconite, employed by Dr Lombard of Geneva, Dr Macleod observes, that "the doses in which he gives it, (two grains every two hours, and occasionally one drachm and a-half in the day,) clearly shows that he refers to something very different from the extract of aconite made in this country." Dr Lombard does refer to something different. The preparation which he employed was the spirituous extract; indeed, the very preparation recommended by Dr Macleod, but reduced by evaporation to the consistence of an extract.* This spirituous extract agrees with the tincture in containing all the active principles of the plant, and especially the aconitine, without the starch and other inert principles, which form so large a part of the watery extract.

Veratria he allows to be an uncertain remedy. The form which he uses is the tincture in doses of five minims three times daily, gradually increased to thirty; and when the veratria itself is used, one-sixth of a grain in the form of pill three times daily, gradually increasing the dose to half-a-grain. The slightest appearance of its physiological effects in numbness or tingling require its discontinuance; but it may be resumed afterwards. Belladonna he recommends to be restricted to external application only.

V. The periosteal form of rheumatism, which constitutes the last, is briefly but correctly described. To us, nevertheless, it appears very doubtful whether, in strict pathological precision, this can be denominated rheumatism, to which it bears no resemblance, except in the kind of pain, and the aggravation of the pain during the night. We must, indeed, regard this, as we have long done, as mere periostitis, generally chronic; and to be treated accordingly.

The author recommends local depletion by means of leeches; the use of calomel and opium, followed by brisk purging; the administration of the iodide of potassium, sarsaparilla, blisters, and the use of the warm bath. All these remedies except the calomel and opium we think good; the best perhaps the leeches and repeated blistering. But we hope he will not be displeased with us for saying, that he does not mention one remedy which we have found the most efficacious of all; that is, a good deep clean incision of the affected membrane down to the bone.

VI. Dr Macleod subjoins in Chapter xiv. several tables illustrating the statistics of rheumatism; and from these he deduces several useful inferences.

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* Edin. Med. and Surg. Journal, Vol. xliv. p. 542.

Table showing the age and sex of those affected with Rheumatic Fever.

Ages.	Males.	Females.	Total.
10 to 15,	4	4	8
15 — 20,	23	25	48
20 — 25,	29	17	46
25 — 30,	25	17	42
30 — 35,	18	9	27
35 — 40,	9	8	27
45 — 50,	3	0	3
50 — 55,	3	4	7
55 — 60,	1	0	1
Total,	137	89	226

" From the preceding table, it would appear that in both sexes from 15 to 30 is the period of life most obnoxious to rheumatic fever; 136 out of 226 cases having occurred within the period specified. The tendency to the disease is much diminished after 40, and after 50 it is comparatively rare.

Periods during which the cases of acute Rheumatism were under Treatment.

Discharged cured.		Relieved.	Dead, or Rheumatic Pericarditis in its acute form.
In 1 week,	15	0	3
10 days,	8	0	0
12 —	9	0	0
14 —	28	0	0
In 2 weeks,	45	0	0
— 3 —	50	4	0
— 4 —	38	5	0
— 5 —	18	0	0
— 6 —	24	5	0
— 7 —	4	2	0
— 8 —	6	1	0
— 10 —	2	0	0
— 12 —	2	0	0
— 16 —	2	0	0
Total,	206	17	3

" It thus appears, that of the 206 cases of rheumatic fever, 148 were discharged cured within a month: and when it is borne in mind that it was a rule rigidly enforced not to send out patients who have had acute rheumatism as soon as they ceased to complain of pain, we may safely assert that the number above specified was cured within three weeks—110 within a fortnight, and 60 within eight days. In a small number, perhaps one-eighth of the whole, the disease was absolutely cut short at once within two, three, or four days, and in five or six cases it was (even though accompanied by much swelling and redness of one or more joints) completely arrested within twenty-four hours. To effect this, however, various concurrent circumstances were required, the chief of which were, a young subject, a constitution previously healthy, and a very recent attack.

"Of the 226 cases of acute rheumatism above alluded to, the heart was affected in 52, or rather more than one-fifth; but taking the whole number of cases of rheumatism, including every form, the proportion of such complication I believe to be little more than half the above.

"Of the total number of patients labouring under acute rheumatism, 137 were males, and 89 females; of the former, 28, and of the latter, 24, had symptoms of pericarditis; or, of the men, rather less than one in five, and of the women, rather more than one in four.

"Of the 52 cases in which the heart was implicated, I find it recorded of only one that the pain in the limbs was simultaneously so alleviated as to give the least colouring to the idea of metastasis.

"In 48 of the cases alluded to, the heart affection was preceded by rheumatism of the limbs; in four, the pericarditis came on first, and was succeeded by acute rheumatism of the joints; in one patient, on the third day; in two at the end of forty-eight hours; and in one, at the end of twenty-four."—Pp. 152, 155.

The following Table gives the ages of those who had Rheumatic Pericarditis.

Age.	Males.	Females.	Total.
10 to 15,	3	1	4
15 — 20,	9	7	16
20 — 25,	6	10	16
25 — 30,	4	6	10
30 — 35,	3	0	3
35 — 40,	0	0	0
40 — 45,	1	0	1
45 — 50,	1	0	1
50 — 55,	0	0	0
55 — 60,	1	0	1
	28	24	52

"But few children are admitted in St George's Hospital; but from what I have seen in private and dispensary practice, I am inclined to believe that the proportion of cases of rheumatic pericarditis is considerably greater in young subjects than in those more advanced in years. Of those referred to in the preceding table of cases of acute rheumatism, but eight were under fifteen years of age, and of these, four, or one-half, had pericarditis. Between 15 and 20, there were 48 patients, and of these 16 had pericarditis, or one-third; between 20 and 25 years of age there were 46 patients, and of these 16 had pericarditis, being very nearly the same proportion as the preceding; between 25 and 30, there were 42, and they afford only 10, or not quite one in four. After this the proportion of cases rapidly diminishes; for from thirty to thirty-five we have twenty-seven cases of rheumatic fever, giving us only three of pericarditis, or one in nine; and from thirty-five to forty we have also twenty-seven cases of rheumatism, without one of pericarditis.

Capsular Rheumatism.

Age.	Males.	Females.	Total.
10 to 15,	0	1	1
15 — 20,	2	1	3
20 — 25,	4	7	11
25 — 30,	4	1	5
30 — 35,	3	2	5
35 — 40,	12	3	15
40 — 45,	7	5	12
45 — 50,	7	3	10
50 — 55,	4	3	7
55 — 60,	3	6	9
60 — 65,	1	2	3
	47	34	81

"According to the preceding table, capsular rheumatism would seem to be considerably more prevalent among men than women; much more equally diffused over the different periods of adult age than the form of the disease first described; and much more prone to affect persons under forty, than genuine gout is. At the same time, it is more the disease of middle life than either rheumatic fever or muscular rheumatism; from forty to forty-five years of age giving us twenty-two out of eighty-one cases, or rather more than one-fourth, which is a much larger proportion than holds good with respect to either of the others.

Periods during which the cases of Capsular Rheumatism were under Treatment.

	Cured.	Relieved.
1 week,	0	0
2 —	8	1
3 —	11	0
4 —	12	2
6 —	13	3
8 —	13	0
10 —	4	0
12 —	4	0
16 —	1	0
20 —	1	0
24 —	1	0
	68	6

Fatal disorganisation of the joints,	3
Urethral discharge,	2
Inflammation of the eye,	2
	7

Of the fatal affections of the joints recorded in Chapter VIII., several occurred in private practice, and are not included in the above.

"The most remarkable circumstance in this table is the length of time during which some of the patients were under treatment, as compared with those labouring under the other forms of the disease. Of the cases of acute rheumatism, properly so called, as we have seen, more than one-half were discharged within three weeks, whereas the number of those with capsular rheumatism discharged within the same period amounts only to twenty out of eighty-one or within a fraction of one-fourth. Of the cases of rheumatic fever, one half were discharged cured in three weeks; of the cases of capsular rheumatism, more than half remained in hospital at the end of six weeks.

Cases of Rheumatism chiefly affecting the Muscles.

Age.	Males.	Females.	Total.
15 —20,	2	4	6
20 — 25,	4	4	8
25 — 30,	5	5	11
30 — 35,	9	3	12
35 — 40,	5	4	9
40 — 45,	3	4	7
45 — 50,	6	2	8
50 — 55,	2	2	4
55 — 60,	5	0	5
60 — 65,	4	1	5
65 — 70,	4	1	5
	49	31	80

"So far as this table goes, it would seem to show a remarkable difference between the ages at which the fibrous and muscular forms of rheumatism are most prevalent. In the former instance, from fifteen to twenty years of age gave about *two*-thirds of the entire number of cases; here the same period gives only 25 out of 80, being rather less than *one*-third. After the middle period of life, as we have seen above, the tendency to rheumatic fever progressively and rapidly diminishes. Not so with regard to the muscular form of the disease, which is spread more equally over the whole period of adult age: of the acute fibrous cases, only eight occurred between the ages of 50 and 60, being rather more than one-twenty-eighth part of the whole number; whereas the same period gives 9 cases of the more chronic muscular form, being very nearly one-ninth of the whole."—Pp. 156, 160.

The foregoing account of this volume will show that it furnishes an excellent practical history of the disease of which the author professes to treat. It contains, indeed, a great amount of precise and correct useful information; and, coming from an hospital physician, who has studied the subject with much attention, it cannot fail to be received with great interest by the profession. If, on some points, we have not assented to all the doctrines and views promulgated in it, we trust that we have expressed difference of opinion in a spirit of candour and impartiality, not because we deny their justice, but because a larger amount of unequivocal evidence we believe to be requisite to establish their accuracy. We hesitate not, nevertheless, to say, that the work of Dr Macleod on Rheumatism contains the most instructive account of the disease we possess.

Art. II.—*Observations on Tuberculous Consumption, containing new views on the nature, pathology, and cure of that disease, being an attempt to found its treatment on rational principles.* By J. S. Campbell, M. D., M. R. C. P., and Senior Physician to the St Mary-le-Bone General Dispensary, &c. &c. Illustrated by coloured drawings, London, 1841. Pp. 404.

The work before us, we are informed, had its origin in certain new views on the nature of Phthisis, which had led the author for many years to look upon this frightful disease in a very different light from that generally adopted, and to practise a method of treatment which has, he persuades himself, in his hands, proved eminently successful. It has been his object, therefore, to fill up a link in the chain of cause and effect which was previously wanting, to connect, in truth, early errors in digestion, (Dyspepsia), with final pulmonic deposition.

Before entering upon the consideration of his subject, our author treats in a lengthened preliminary chapter on the connection between the blood and life. In this he makes no pretensions to originality. But it serves as an introduction to the elucidation of his own views on the formation of tubercle.

We cannot but think that a considerable portion of the space which he occupies in this chapter might have been better employed in the consideration of the physical signs of the disease. Nothing is more important than this department of the subject. It is the only one which enables us to detect the disease at an early stage when it is amenable to treatment; and our author has, we may almost say, passed it over without mention,—at all events without due consideration. This must be regarded as a defect in the work.

Dr Campbell regrets, with every recent author on the subject of phthisis, the loose and indefinite terms which have been applied to this disease by medical writers. The word phthisis, indeed, from being a generic term, of which the tubercular form was only a species, has come to be used as specific of tubercular consumption. Our author proposes to be more definite in his delineation of this disease. He says, " I should wish the following pages to be considered as referring exclusively to a disease which manifests its presence by an assemblage of symptoms, of which cough, impeded respiration, especially on muscular exertion, emaciation, hectic fever, and expectoration in the later stages, are the more prominent and constant, and such symptoms depending upon the deposition of tubercular matter in the lungs." Such an assemblage of symptoms are, we well know, not characteristic of tubercular phthisis, but are occasionally to be found in chronic pneumonia and chronic bronchitis; and had he not appended the state of the lungs from which these symptoms arise, we should have had doubts whether or not he had treated always the proper disease for tubercular phthisis.

Dr Campbell, with the view of laying before his readers a notice of the present state of the question regarding the origin of tubercles, as collected from the works of modern pathologists, divides his subject into three heads—1. Is tubercle of the lung, the result of inflammatory action? or 2. Of a morbid condition of the function of secretion? or 3. Of some error in the process of nutrition? We shall successively glance at these sections. First, then, is tubercle of the lung the result of inflammatory action? Our author, after stating the arguments which have been adduced for and against this opinion, goes on to state his own conclusions.

> "Nor do the facts elicited either by the inspection of bodies dead of phthisis, or by direct experiment on healthy animals, countenance a belief in the inflammatory origin of tubercles. The anatomical examination of a lung so situated affords the best evidence on the question immediately under discussion. The lung often appears perfectly crepitous to the edge of the tuberculated part. There is no consolidation of the tissues around it, or any appearances by which the anterior presence of inflammation is usually recognized. Different appearances, however, are presented when phthisis advances towards its close—the pleuræ adhere, and the lungs are consolidated by inflammation."

We shall pause for a moment and glance at our author's remarks on what he seems to view as an established point—"that direct experiment, the conclusions of morbid anatomy, and the result of observations in cases of phthisis"—all militate against the belief in the inflammatory origin of tubercle.

What, then, has direct experiment shown us? Mr Clayton, so early as 1694, injected mercury into the veins of a dog. The animal died sixteen weeks afterwards of consumption. The lungs, upon examination after death, presented the appearance of many suppurations or abscesses, and in the centre of each of these a small globule of liquid mercury was found. Dr W. Saunders of London next experimented on this subject. He injected two drachms of quicksilver into the crural vein of a dog, which was followed in a few days with symptoms denoting inflammatory action existing in the lungs. The period of time which the animal lived afterwards is not mentioned, but the lungs, upon examination after death, were found in a tubercular state, each tubercle presenting in its centre, on a section being made of it, a small globule of quicksilver; many of the tubercles had suppurated, and formed vomicæ.

Cruveilhier too, and Dr Kay, the former in 1826, the latter in

1828, made experiments on this subject, which are very satisfactory. Quicksilver was injected into the femoral artery of a dog, and, on its being killed a few days afterwards, the cellular tissue of the limb was found studded over with thousands of little miliary tubercles. Cruveilhier also injected into an opening in the windpipe of a dog about two drachms* of mercury. The most of it was rejected by coughing, but the animal soon became emaciated and phthisical, and died at the end of a month from the operation. The lungs were found stiffened with tubercles, isolated and aggregated, presenting all the characters of miliary tubercles. Dr Kay also produced similar appearances in the lungs of rabbits, by injecting mercury into the windpipe. The late Dr Home of Edinburgh, too, has recorded a case, in a valuable paper on the disease in question, in this Journal, where, in the lungs of a stone mason, studded with numbers of tubercles, he found in the centre of each of them a small granule of silicious matter. It is well-known that those trades and occupations which are exposed to the inhalation of particles of any irritating substance floating in the atmosphere, are very subject to this disease,—such as hewing masons, quarrymen, knife-grinders, needle-pointers, &c.

The experiments and facts above-quoted, part of which our author has noticed, and the remainder of which must be known by him, seem to him not satisfactory. He says, "Had similar results always attended on similar experiments, they would doubtless go far to prove the direct connection between bronchial irritation and tubercular deposit; but very different effects have arisen from trials made by other hands. MM. Andral and Lombard, who repeated them with due precautions, arrive at contrary conclusions." We do not think that this is the case; but we shall quote from M. Andral's own words the conclusions at which he arrived, from the examination of the experiments of Dr Lombard. "I have no doubt, if these experiments were conducted on a larger scale, that genuine tubercles would be found in the lungs of some of the animals; but I should be inclined to regard them in such cases as the product of a peculiar disposition, brought into action by the irritation artificially created in the bronchia." We ought to have mentioned before this, that our author made "several experiments" on this subject; the animals soon recovered their usual health, and upon dissection, the lungs were found presenting the same appearance, as M. Andral has described. "The globules of mercury being surrounded with a layer of soft whitish matter, liquid in some parts, and in others resembling the false membrane of croup." It seems strange that the animals operated on by Dr Campbell should all have regained their health, while those animals experimented on by Clayton, Saunders, Kay, Cruveilhier, &c. all died soon afterwards.

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* Two ounces, according to Dr Campbell, which is a mistake; but, as there are various typographical errors in the work, this also may be one.

We can only account for this result by supposing that Dr Campbell used a very minute quantity of mercury in his experiments, as he has nowhere stated the quantity employed.

So much for direct experiments in producing tubercles; and we cannot but think that they are sufficient to show, that the introduction of foreign substances into the lungs produces such an irritation in the terminal ends of the bronchial tubes, as leads to inflammation, and that the products of that inflammation cannot be distinguished from tubercles, if they are not identical.

But Dr Campbell also says that the conclusion from morbid anatomy militates against the belief of the inflammatory origin of tubercles.

We do not intend to enter at any length into the disputed question regarding the identity of the pulmonary granulations of Bayle, and the crude tubercle, the more especially as we shall shortly refer to them afterwards; but we may remark, that there seems to exist and really can be very little difference of opinion on one point, viz. that the pulmonary granulations (the miliary tubercles of the French) do often take their origin from simple irritation of the lungs. How often do we find them existing in this state in persons dying of other diseases, and in whom their origin was distinctly referable to an attack of prolonged catarrh or bronchitis? In quarrymen, hewing-masons, knife-grinders, &c. the lungs are almost always found, with more or less of these granulations, arising, without doubt, from the irritation of the particles of metal or stone which these workmen inhale, and which at length produces inflammation, leading, in the first instance, to the effusion of this semitransparent gray matter.

All who work at such employments become subject to this disease. It surely is unnecessary to argue that all such men are not of a scrofulous constitution, and yet they become affected with these miliary granulations. Their inflammatory origin seems, therefore, satisfactorily established; what then does morbid anatomy point out regarding these miliary granulations and tubercles?

We shall, in answer, quote the observations of Dr Alison and M. Louis on this subject, and, at the same time, state that similar opinions are held, and have been urged by Laennec, Gendrin, Papavoine, Tonnellé, Clarke, Craigie, Home, &c. &c.

"The following," says Dr Alison, "may be stated as the distinctive characters (known from the examination of many different bodies, in which they exist in different stages of progress), of scrofulous tubercles." "They are at first very minute, soft, or of nearly gelatinous consistence, of a grayish colour, and of a somewhat opal ine lustre, have more or less of the rounded form, and are very often set together in clusters on the membranes, or in the textures where they are formed, *(Tubercules Miliares.)*"

"They afterwards enlarge considerably, several of them generally coalesce into one irregular mass, and they become opaque, yellowish, and of the consistence of soft cheese, *(Tubercules crus).*" —(Pathology, p. 469.)

"These granulations," says M. Louis, "form, according to the beautiful researches of Laennec, the first stage of tubercles through which the latter must pass before assuming those characters which are peculiar to them. As in the case of tubercles we have found them larger, more numerous at the apex than at the base of the lungs, and limited to the former, if not existing in the whole of their extent. At a certain period of their development, they present a yellow opaque point at the centre; this point was large in proportion as the granulations were nearer the summit of the lungs; and, in examining these viscera from below upwards, they were generally seen in the following order: 1. grey semitransparent granulations; 2. granulations less clear and yellow towards the centre; and 3. granulations of a yellowish-white in their whole extent, that is, completely tuberculous. These last were, in the majority of cases, the only ones observed at the summit of the lungs. It was rare to find either tubercles or the gray semitransparent granules existing singly in the lungs. The first of these cases we have only met with twice, the second we have observed in five subjects, though even here there were some granulations, more or less milky and yellow in the centre."

"These facts appear to us incontestibly to establish the transformation of the gray semitransparent granulations into tuberculous matter."

Morbid anatomy, therefore, appears strongly to establish the inflammatory origin of miliary granulations, and consequently of tubercles.

But Dr Campbell says also, that the result of observation in cases of phthisis tends to a contrary belief. We know not what kind of observation he refers to, but presume it is that of the symptoms of the complaint. On this it may be unnecessary to dwell at any length here, either, as the symptoms present, in the early stage of a case of phthisis, may be either well marked or not, and yet it does not at all militate against the inflammatory origin of tubercle. We well know that the symptoms which distinguish scrofulous inflammation are much less severe in degree, and much less distinctly marked than in inflammation of any kind in a healthy constitution. In the example of the external lymphatic glands, when they become inflamed in a scrofulous habit, there is little pain and heat, and little change of colour for a long time; the progress to suppuration is slow, and attended with little or no constitutional symptoms. So with the inflammatory action, which deposits tuberculous matter in the lungs, the symptoms attending the process are slightly if at all perceptible, and our belief is, that it is only when the constitution begins to suffer from great deposition or softening beginning to take place, that symptoms of irritation or fever manifest themselves.

According to the best authorities, however, we have, in by far the majority of cases, more or less fever, so much so, indeed, that many most respectable authorities are in the habit of recommending considerable depletion in the early stage of phthisis, for the purpose of abating the intensity of this fever, and the inflammatory process in the lungs, which is the cause of it.

Inflammation then produces tubercles in the lungs in the following manner;—Irritation is excited in the terminal bronchiæ, and proceeds to inflammation. This inflammation in a healthy subject gives rise to bronchitis or pneumonia, according to its severity, and terminates in the usual way in which these diseases do; but in a scrofulous habit the inflammation which is lighted up is of a peculiar kind, and, instead of giving rise to any of the usual products of bronchial or pulmonic inflammation, forms genuine tubercles.

Dr Campbell avows that such an argument completely invalidates the opinion, that inflammation can of itself produce tubercles. "It indeed shows," says he, "what is not usually denied, that the two states frequently coexist; but in concluding that the one condition can produce the other only in 'certain constitutions,' they leave the main question much where it was found; for, if a certain constitution is required to form, as it were, the substratum on which inflammation acts before tubercles can be produced, it amounts to very nearly the same thing as saying that its deposition depends upon some other unexplained condition of the body, which is only called into action by the inflammatory process."

We cannot see the force of Dr Campbell's argument. It is well known that catarrhs in certain constitutions occur often without giving rise to any permanent disease of the lungs. But, let a catarrh or slight attack of bronchitis occur in an individual of a strumous habit, or whose constitution is at the time in a cachectic state, a degree of inflammatory action is lighted up, which in the former would have either rapidly passed away, or given rise only to a slight bronchitis; while in the latter it gives rise to a species of slow, insidious, and, we have no hesitation in saying, peculiar inflammation, which leads to the formation of tubercle.

The deposition of this tuberculous matter is not produced, it will be observed, by the constitutional taint; it is produced by the peculiar nature of the inflammatory action, which has a tendency only to affect certain bronchial terminations, and to effuse a fluid albuminous matter into them which, soon becoming more solid and concrete, forms tubercle.

Dr Craigie, in his valuable work on the Practice of Physic, has strongly insisted on the fact, that there is nothing inconsistent in allowing a certain morbid state of the constitution along with a degree or form of local inflammation. "Inflammation," says he, "assumes different forms; and that which is chronic in progress, and insidious or obscure in symptoms, is in an especial manner associated with a disordered state of the system or rather first of the organ or its component tissues." "The inflammatory state which introduces and attends consumptive symptoms is neither pneumonia nor bronchitis, but slow or chronic inflammation of the vesicles or terminal ends of the air tubes of the lungs; in short, a vesicular bronchitis or vesicular inflammation, which differs from the ordinary vesicular bronchitis; in beginning in the upper lobe, in affecting not the whole of the vesicles at once but a few successively and progressively, in effusing a quantity of viscid plastic albuminous matter, and in proceeding much more slowly and insidiously, though steadily, than the usual distemper."—Pp. 1003–4.

Nothing, it appears to us, can better exemplify the fact of tubercle being the result of inflammatory action alone, in many cases without any individual predisposition than the following. Take the case of any body of workmen who are exposed to the inhalation of those irritating particles which are well known to give origin to tubercular consumption, for instance, such persons as knife-grinders, needle-pointers, or, what is more common in this town and neighbourhood, hewing-masons and quarrymen, and we find that a great majority of those either die of tubercular phthisis, or present all the symptoms of it before they are many years in the employment. It would be absurd to suppose that all such had a predisposition for the disease; some of them may, but we cannot allow that all have; the more especially from the fact, that many of them, who, upon the appearance of such symptoms, give up their deleterious employment, live to a good age afterwards. But it is needless to go further into the arguments in favour of the inflammatory origin of tubercles; they have been adopted, and more or less forcibly insisted on, by Sir John Pringle, Dr Donald Monro, Cleghorn, Tissot, Stoll, Portal, Broussais, Schroeder, Andral, Alison, Carswell, &c. &c. and, in addition to the direct experiments which we have previously related, the following circumstances seem strongly to corroborate the inflammatory origin of the disease in question, if not to determine the point positively.

1. The introduction of irritating substances into the lungs, in trades, &c. and by direct experiment on the lower animals, (experiments frequently repeated, and all tending to the same results,)

have shown that the excitement of inflammatory action, in the terminal ends of the air tubes, gives rise to the formation of tubercle.

2. In the early or incipient stage of tubercular consumption, febrile and inflammatory symptoms are always manifested to a greater or less degree.

3. The blood when drawn at the commencement of this disease invariably presents a thick buffy coat with firm clot.

4. The result of the statistical tables of the army and navy show that nearly four-fifths of the fatal cases of pulmonary disease arise from consumption, and that the disease is almost invariably of an inflammatory origin, or resulting from neglected catarrh or bronchitis.

If it appear that we have spent too much time in discussing this question, of the primary cause of tubercular deposition, it must be kept in mind that a great part of the success which we expect to obtain in the treatment of this disease, must arise from properly understanding the question. If we believe with some, and with our author, we are treating an effect; if, on the other hand, the opinions which we have expressed above be correct, we shall treat as we ought to do the *origo mali*, the cause, not the effect.

Is pulmonary tubercle the result of an error in the function of secretion? The opinion of some of the older authors, and of M. Andral, that tubercle is a morbid condition of the perspiratory secretion, gives the idea expressed in the above query some weight. Our author, however, very justly indeed, and after giving the opinions of authors their due weight, comes to the following conclusion. "There are two methods which nature employs in elaborating new substances from blood," glandular and membranous secretions, "the matter of tubercle therefore, may be produced in one of two ways, either by glandular bodies situate in the lungs or by their minute arteries alone, independent of any glandular action." "The only pulmonary glands, so far as anatomy reveals, consist in the mucous follicles distributed liberally over the lining membrane of the organ."

The facts with which morbid anatomy supplies us appear fatal to such a hypothesis; for we rarely find tubercles placed in such situations, but constantly in the substance of the lung; and if it was a morbid condition of the perspiratory secretion, it is obvious that tuberculous deposit would be common in the cutaneous textures, the reverse of which every anatomist knows to be the case.

Does tubercle result from an error in the function of nutrition? Our author believes that it does, and holds, on this department of the subject, views which, if not new or peculiar to himself, are nevertheless not so generally entertained, we believe, as those already considered.

Our author devotes his second chapter to tubercles of the lung, and occupies his pages with discussions on their immediate dependence on local errors of action, their early appearance, the non-identity of gray granulations and crude tubercles, and theory of their local formation.

Dr Campbell, as we have already had occasion to mention, expresses his belief, with Bayle, Andral, and others, that the gray semitransparent granulations and the crude yellow tubercle have a different origin. This conclusion he arrives at from a consideration of the following circumstances, and his own experience.

Their constant co-existence does not establish their identity. If all tubercles commenced in a gray granulation, we should have this appearance as a primary one in other organs and tissues, (Laennec has stated that they do), but even although they do co-exist, it does not follow that the yellow tubercle has ever been in the condition of a gray semitransparent granulation. To these arguments our author adds others, derived from the action of certain reagents, and decomposition, on gray granulations and crude tubercles.

The following are the results of Dr Campbell's investigations.

Decomposition in water affects the granules equally with the lungs; they become equally soft and pulpy throughout.

The yellow tubercle is precipitated to the bottom of the fluid, as soon as decomposition has taken place to a certain extent, so that at the bottom of the fluid you may soon collect a quantity of the yellow tubercles alone.

Crude yellow tubercles are dissolved in *Liquor Potassæ*, whether separated and immersed in the liquid, or allowed to remain in the lung and inserted in the liquor.

The gray granulations are simply affected by reagents in the same way as the lung itself. This appears to Dr Campbell to show that they are different in chemical composition, and that this is another strong evidence against their identity.

Notwithstanding all these arguments, Dr Campbell has failed to convince us that they are not identical. This is a subject to which we have long given consideration; and although we entertain the belief in their identity, we are ready to relinquish it upon seeing satisfactory arguments or proof to the contrary. Our practical experience has certainly been in favour of their identity. The semitransparent gray granulations which are seen in the lungs of stone masons, knife-grinders, &c. which no doubt arise from the irritation of the noxious particles, can be traced passing into the yellow tubercle. This has been strongly stated by M. Louis in the passage we have already quoted, and is equally so by Schroeder, Alison, and various other authors. The constant co-existence of the two sets of bodies, not only in the lungs but in other organs, and more especially in the glands of the intestines. Unfortunately too many opportunities are daily afforded in the frequency and deadly nature of this disease, for any medical man to make himself acquainted with the appearances which the glands of the intestines present in those destroyed by it. Some are small and hard and of a gray colour, others larger and filled with yellowish mattter, while others have passed on to softening and ulceration.

We know that these miliary granulations frequently do exist in the lungs for a long time, without giving rise to tubercular masses. This has been indisputably pointed out by Carswell, Andral, &c.; but it does not militate against their identity. Out of 123 cases minutely recorded by Louis, only two presented lungs in whom both did not co-exist. It does not follow, besides, that the crude tubercle must of a necessity first appear as a pulmonary granulation. On the contrary, we believe with Schroeder, that many of the crude isolated tubercles that are occasionally to be met with in the lungs, are in the bronchial glands. They, of course, follow the usual course of tubercles when deposited in the air-cells; nor does this circumstance militate against the identity of the two; it rather explains the circumstance of isolated tubercles being found in the lungs without granulations, a peculiarity which, although rare, is yet occasionally seen.

We now come to consider the author's views regarding the deposition of tubercle. We have already mentioned that he differs from those who believe that tubercle is the result of inflammation and of abnormal secretion, while he adopts the opinion of those who advocate the idea that it arises from an error in the function of nutrition. It was natural to expect that Dr Campbell should adopt that opinion which appears to suit best his own views. It is not in their favour, however, that all his hypotheses and observations correspond more precisely than many other subjects of belief, founded on more abundant observations, and more satisfactory experiments and reasoning; and although we have heard the above remark made more than once, yet we incline to give Dr Campbell every credit for his opinions, and declare that, if he has failed to convince us, it is more from the paucity of his observations and experimental researches, and the little weight and consideration he gives to the opinions of those opposed to him, than that there is anything contradictory or absurd in the hypothesis he wishes to establish, and the proofs he adduces in its support. We shall proceed to state this shortly to our readers.

It may be necessary to premise that Dr Campbell believes with Dr Lombard, that tubercles are not deposited in the air-cells or bronchial glands, but that they are situated in the minute vessels which ramify on the lining membrane of the air-cells. He considers also every yellow body, however minute it be, a tubercle.

Dr Campbell observes that there is a lesion antecedent to that of the secretion of tubercles, viz. the deposition of a minute yellow point. This point, Dr Campbell thinks, originates in the blood, and as pus globules have been detected in this fluid in the advanced stages of phthisis,* so does he think that tubercular matter must exist previous to such symptoms making their appearance.

We shall afterwards inquire how such matters are to get into the blood. When they are there, Dr Campbell imagines that they are sent along the pulmonary venous circulation, where they fail to undergo the proper changes necessary for their being sent back along with the arterial blood, or, being of larger dimensions than the pulmonary capillaries can permit to pass, they remain there and form tubercles. In illustration of this, it is well known, that when oily or other thick matters which mix mechanically, not chemically with the blood, are injected into the circulating mass of fluid, death soon follows; and Dr Campbell believes that this event is produced by the oily particles lodging in the pulmonic capillaries, and producing an obstruction in that circle of capillaries. A series of experiments resulted from our author's reasoning on this mattter. He made injections from the human lungs, both in their healthy and unhealthy state; and from these injections he obtained the following results. When the common injection of tallow, olive oil, and vermilion, (to colour it), was injected into the pulmonary veins, it, in cases of healthy lungs, without any predisposition to struma, came out at the pulmonary arteries, of the same colour as when injected into the veins; that is to say, that the capillaries had been capacious enough to allow this matter, when forcibly injected, to pass through them. In individuals of a strumous constitution, whether or not their lungs contained tubercles, the injection came out at the pulmonary arteries deprived of its colouring matter. From this, therefore, Dr Campbell infers, that the pulmonary capillaries are of smaller dimensions in individuals of the peculiar strumous habit, than in those of a healthy constitution, and, therefore, that predisposition to phthisis consists in an unusually small formation, that is, we presume, unusually small calibre, of the capillaries of the lungs.

"The whole tenor of the preceding remarks," says he, "tend to the conclusion, that this predisposition is traceable to an unusually small formation of the minute arteries of the pulmonary circle, which, doubtless, varies in degree as well as in the number of the vessels which present it in the same lung; while the determining cause of the disease is to be sought in that condition of the blood, which, being produced by causes fluctuating in their nature, but acting through it on an organization inherently imperfect, leads finally to those results by which the material cause of tuberculous phthisis is established."—P. 157.

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* It is but justice to Dr Campbell to mention, that he has examined the blood of patients during the early stage of phthisis without finding any peculiarity whatever in it.

We have thus traced, according to our author's views, the tubercular matter existing in the blood, and its deposition in the capillaries of the lungs. But there is a process antecedent to the appearance of these germs of tubercular matter in the blood, which brings us back to the point, that this matter seems to be produced by an error in the function of nutrition. This, though an interesting subject of inquiry, has unfortunately not as yet·been minutely investigated. It is not so discussed by our author as we would like to see it; but we shall give our author's observations in his own words, that we may afford our readers his views precisely, at the same time that they are presented with a specimen of his writing.

" The circumstances under which tubercles of the lung arise are by no means fully determined, even supposing their matter to exist in the blood, and our theory of its location to be correct; for it is evident that its appearance there necessarily involves the operation of some anterior morbid change of which this matter is the result.

" Many circumstances encourage the conviction, that this error, which constitutes so important a part in the phthisical constitution, is connected with some one or more of the various processes by which aliment is finally converted into blood, and this conducts to the inference, that the primary cause of tubercular consumption has its seat in the digestive organs.

" It would appear probable that the primary error of digestion which conduces to the establishment of phthisis, lies at a point in its series of actions anterior to that of final sanguification; for as the blood contains abnormal consituents, these are most probably thrown into it before reaching the lungs; but at what point they originate, or by what immediate change they are produced, are questions which, it seems to me, we are as yet unable to answer."—Pp. 163–164.

Sedentary occupations and the want of free air are considered by Sir James Clarke and many other authors to be a very common cause of phthisis; and whether or not we explain it according to our author's views, or with others adopt the opinion, that the confinement and want of air produce a cachectic state of the constitution, which is unusually favourable to the deposition of tubercle; it is nevertheless of the greatest importance to be kept in mind, that a great number of the young females in the upper ranks of life, and a considerable number also of the young men who are engaged in sedentary occupations in large towns, fall victims to this disease, which is ushered in or first manifests itself with dyspeptic symptoms.

In the treatment of phthisis, upon which the author next enters, we find him expressing the following belief:—" Phthisis is not only frequently arrested in its progress, or remedied after full development by some obscure sanative effort of the system, but that, besides this, it is a disease amenable to the control of remedial means when these are applied in a proper manner, and directed under the guidance of a rational pathology."

To accomplish this it is necessary to look at Dr Campbell's views of the pathology of the disease, and his indications of cure. They are, as a matter of course, in accordance with the statements which we have previously made regarding them.

> " The pathology of consumption, already sufficiently explained," says he, " recognizes three stages.
>
> " *First,* A primary stage, connected with erroneous action of the digestive organs, in consequence of which the matter of tubercle is presumed to be produced.
>
> " *Secondly,* A deteriorated state of the blood induced by this, during the continuance of which that fluid presents one of the conditions necessary to the formation of tubercles, their location being contingent on a peculiar pulmonic organization, whose presence is therefore essential to a full production of the disease.
>
> " *Thirdly,* A stage of reaction towards the entire organs and functions of the body, as a direct result of tubercles after their location; the intensity of this being dependent, not on their amount alone, but also on the peculiar influence which they frequently exert on the pulmonic circulation.
>
> " The indications of cure which arise as direct corollaries out of these positions are consequently three also.
>
> " *First,* To counteract that morbid state of the digestive organs, originating the matter, without which tubercles cannot be produced.
>
> " *Secondly,* To accomplish a solution of this matter after it has passed into the blood, and thus arrest its local deposition, presumed to depend on mechanical retention in the extreme vessels of the pulmonary artery.
>
> " *Thirdly,* To place and retain the patient under such circumstances, in reference to his medical, dietetic, and general treatment, as seems on rational principles, best calculated to meet those evils which result from the existing state of his respiratory organs; thus affording time for removal by the natural process of softening of such tubercles as already actually exist."—P. 224-225.

Our author, therefore, begins his remarks on treatment, by detailing to us his observations on the premonitory dyspepsia, the first link in the chain of morbid phenomena where the error lies. It may be unnecessary, as it would be tedious, to follow him through the dietetic and medicinal treatment of this dyspepsia. Suffice it to say, that his treatment differs little from that of other physicians of the present day in the same disease, consisting of mild farinaceous diet, alteratives (of which our author prefers by much, the mercury with chalk, and combined with rhubarb, aromatic powder, and ipecacuan,) purgatives, together with continued counter-irritation over the abdomen, by means of stimulating liniments, and the occasional use of the warm bath. Dr Campbell does not approve of the use of tonics at any stage of the disease; but when he does administer them, they consist of infusions of the milder bitters, cinchona, &c.

We have already mentioned our author's experiments on the effects of the pure alkalis on tuberculous matter, that they were found to dissolve it, whether remaining in the lung or extracted from it. Now, although the treatment of phthisis by alkalis is by no means new, we do not remember if it has ever been proposed with the same indications of cure, as our author does in the work before us. He carries his ideas, resulting from experiments conducted in glass bottles, into the interior of the human system, and supposes that, if alkalis dissolve crude tubercles out of the body, they will probably do so in it, or at least they may destroy the germs when (as he supposes) they exist in the blood, and consequently prevent their deposition in the lungs, counteracting, in fact, that state of the system which leads to the development of tubercles.

> " In the great majority of cases." says he, " when first seen by the physician, the enemy has been for some time at work, and tubercles already occupy portions of the lungs; the symptoms, therefore, result from two causes; first, from the continued action of the one which produced these bodies and is still adding to their number; and secondly, from the pulmonic reaction depending on their presence. It is a suspension of the first of these actions that alkalis appear to me capable of effecting in a slow progressive manner; and we hence must not be deterred from their persistent use, because symptoms continued to be present which depend on pulmonic conditions, over which, when once formed, these medicines exert little influence."—P. 255.

The alkali must be used as pure and uncombined as possible.

> " In many instances the commencing symptoms of pulmonary disease decline with great rapidity under the use of the alkali; such, I believe, to be those in which the act of deposition is either commencing, or has only been effected to a small extent; here, however, it is always prudent to continue the remedy for some time, even after the symptoms are removed, and have again recourse to it should they recommence."—P. 256.

That Dr Campbell puts much faith in this remedy, may be inferred from the following passages. " In all cases the alkali must be employed as the fundamental part of the treatment." " I conceive this remedy to be of more use than any other in the treatment of tubercular consumption." (P. 258.)

It may also be mentioned that Dr C. uses it in individuals in whom the strumous disposition is well marked, as " anticipative," " or calculated to avert the occurrence of impending deposition."

As we entertain, and have already expressed different views regarding the seat, nature, and mode of formation of tubercles, than our author, it is not to be expected that we can concur with him in his reasoning in this matter. We lay it before our readers, however, with the assurance that the views of Dr Campbell are well worthy of their attentive perusal and trial.

We must caution them, however, in expecting too much from this or any other remedy in the treatment of phthisis. It is not a simple or single disease; it is both of organism and function, and one in which more remedies of very opposite kinds, indeed, have been as strongly recommended as Dr C. has his alkali, for no other purpose than that they should all fall into disuse. We do not say this, however, from any other motive than that of keeping down too high anticipations regarding the use of alkalis in this disease, which, from its incurable nature, must infallibly lead to disappointment. The medicine ought to have a due trial, therefore, and according to the advice, and under the restriction of our author.

As our remarks have extended so unexpectedly beyond the limits we had assigned for them, it will be necessary that we be brief in noticing the other indications of treatment, and the manner in which our author practically accomplishes them. Of diet, with which he begins, light farinaceous food, the *Lichen Islandicus*, milk, well-baked wheaten bread, and, when there are no febrile or inflammatory symptoms, fish, eggs, poultry, game, &c. with a little malt liquor, form the chief articles.

Exercise in such a way that " the air enveloping the patient is constantly renewed without the patient himself being an active agent in the renewal," is the best, such as gentle walking, exercise along a level road, carriage exercise along a level and smooth road, and in an easy vehicle, sailing, swinging, &c.

There is little new in Dr Campbell's remarks on medicinal agents, with the exception of the potass. This he recommends and uses in all cases of the disease.

Our space will not permit us either to enter upon a very interesting chapter, viz. the question, how far a function analogous to respiration may be performed by other surfaces than those of the lung?

Dr Campbell makes a separate section on the treatment of the symptoms of phthisis, and first among them he ranks inflammatory complications. It is curious that Dr Campbell allows the great frequency of such symptoms in cases of phthisis, and remarks, " that it is luckily at an early date that this contingency commonly arises, when the powers of the body are more or less intact." For this Dr Campbell recommends blood-letting, and most properly; and if the disease is taken in time, every practitioner must have observed the great relief which follows a blood-letting or a considerable local abstraction of blood.

Dr Campbell has terminated his work by a list of cases. These he has divided into three orders. In the first set he has recorded ten cases where the disease was taken in its early stage, and treated essentially with the alkali. The disease was made out from the usual symptoms of early phthisis, assisted by the physical signs of the disease. The ten are taken casually from about 280, of a parallel description, which the author has had under his charge during the last ten years.

In reading his cases, we were strongly impressed with the belief that some of them were not to be referred to early phthisis. Case first is obviously of this description, and, indeed, he is candid enough in stating this.

> " Of the fact that consolidation of a portion of the lungs was removed in these examples, I cannot entertain a doubt, but am well aware that the proof of this having originally depended on tubercle may to some appear imperfect."

The second set of cases are those a little more advanced, where the solidification of the lung was greater. Under this head he has reported three cases. The same remarks that we have made on the former set apply to them.

In the third set he has recorded also three cases, in which the evidence of phthisis (advanced) was conclusive. They form, however, the rare exceptions to about 150 of the same kind, all treated with the medicine, who died. The use of the *Liquor Potassæ* in advanced stages of phthisis seems nearly as efficacious as any other remedy, for we have similar flattering accounts of many remedies by the authors who write upon them. If the *Liquor Potassæ* can cure in future trials three out of 180 cases of advanced phthisis, it is a remedy which ought to be in the hands of every general practitioner.

In making the preceding observations we have been anxious to give a correct, though necessarily a brief, exposition of the opinions and views of Dr Campbell. In these it must be allowed that there is both novelty and interest. But it cannot be denied that they are still in the shape of hypotheses on the origin and locality of the *forma morbi*. His views on treatment are, if possible, still more problematical. As his ideas are novel, so are they ingenious, but on that very account do they require the greater amount of experimental inquiry and practical observation.

It appears to us that much may be yet done in this department, and that, as Dr Campbell has in some sense opened a path so far for himself, we would suggest to him a continuation of the inquiry until, at least, he establishes what as yet must still be considered as extremely doubtful and hypothetical.

The foregoing account of this volume will show in general our opinion regarding it. It contains several ingenious and plausible views, and will be perused with interest, and we hope not without instruction.

The plates, (two in number), lithographs printed in colour, are beautifully executed, and represent the subject remarkably well.

Art. III.—*Observations on the Surgical Pathology and Treatment of Aneurism, being the substance of a Course of Lectures on that disease, delivered in the School of the Royal College of Surgeons in Ireland, during the Session,* 1839–40. Part I. By William Henry Porter, A. M. Professor of the Theory and Practice of Surgery in the Royal College of Surgeons in Ireland, Surgeon to the Meath Hospital, and County of Dublin Infirmary, and Consulting Surgeon to the City of Dublin Hospital. Dublin. Pp. 214.

The present work is only the first part of a series of dissertations on aneurism, and includes several interesting chapters on the theoretical and general doctrines of this subject. We presume that the second part will contain particular details regarding individual aneurisms and the different operations.

We are informed that the volume before us took its origin from a variety of interesting and anomalous cases, which had occurred to Mr Porter in the Meath Hospital, which he had embodied in a series of lectures on the subject delivered at the College of Surgeons of Ireland, and which he took an opportunity of illustrating with the splendid collection of preparations in their museum. The contents of the present volume have been some time well known to our Irish brethren, as the lectures appeared nearly in their present form in the Irish periodical, the Dublin Medical Press.

Mr Porter treats of his subject in somewhat like the following division. *Hæmorrhage, Aneurism, Internal Aneurism, the treatment of Aneurism, treatment of Aneurism by Ligature, Diffused Aneurism, Aneurismal Varix, &c.* and *Secondary Hemorrhage.*

One of the most important chapters in the work before us, is the first or preliminary one on Hemorrhage.

Hemorrhage, according to our author, not only includes a lesion of the vessel, and the escape of blood from it, but the existence of an external wound communicating with this vessel, and capable, both by extent and direction, of allowing the whole or the greater part of the fluid to escape freely; while Aneurism, on the other hand, permits the withdrawal of a certain quantity of blood from the circulation, but not from the part or limb in which the injured vessel is situated.

It is alone with arterial hæmorrhage that we have here to deal, and it is not to be wondered at, that the natural process of the stoppage of hæmorrhage from a bleeding artery should have been early made the subject of inquiry by surgeons. Petit, in 1731, attributed the cessation of hemorrhage from a wounded artery to the coagulation of the blood. He observed that there were two coagula formed, one outside the vessel, which closed it up, and one inside, which he supposed acted as a plug; and although we are now better informed as to the manner in which the coats of the arteries act in assisting the suppression of hemorrhage, we must assign to Petit the merit of ascertaining that the coagulation of the blood is doubtless a most important element in the process.

> "Hunter found by experiment. that rest and exposure to the air were the circumstances under which the coagulation of the blood took place most quickly. Now, Nature provides for the repose of the blood, 1*st*, by its being entangled in the cellular tissue; 2*d*, by the gradual diminution as it flows, of the size and velocity of the stream; 3*d*, in cases of a large or a rapid abstraction of blood, by the occurrence of syncope, which, weakening or withdrawing the impulse of the heart from the circulation, generally affords sufficient time for the clot to be formed without disturbance; and 4*th*, by the rapidity with which the blood coagulates.
>
> "The influence of exposure to the air in stopping hæmorrhage is too obvious to require proof. Every student has seen cases in hospital after operation, in which a hemorrhage, which took place when the patient had become warm in bed, was controlled by little more than the removal of the dressings, and the opening of the wound. But there is a beautiful provision, which alone would be sufficient to prove, that the coagulation of the blood was intended to prevent the loss of that important fluid. Jones, in his sixth experiment, found that a tea-cupful of blood, taken immediately after the division of an artery, coagulated in five minutes and a few seconds. The same quantity, taken a quarter of an hour afterwards, (by which time the animal had lost an immense quantity of blood, and appeared very faint), coagulated in three minutes and a half. Thus, it appears that in proportion to the loss of blood, and the imminence of the danger, is the tendency of that fluid to coagulate increased, and the chief, if not the only resource, which is eventually to preserve life, furnished when most required."

It is a very generally received opinion, that an artery that is torn across, or otherwise mutilated with a rough or blunt instrument, seldom bleeds, at least to any extent. The remarkable case related by Cheselden, and various others, which have been recorded since that time, in which whole limbs have been torn away without any hemorrhage of consequence occurring, has made it almost proverbial, that such injuries are seldom attended with much bleeding. Mr Porter, however, cautions us against believing that the means which Nature puts in force in such distressing cases always prove availing. Thus, he says, "Not long since, a man was brought into the Meath Hospital, whose fore-finger was broken and lacerated in a steam-engine. He resisted amputation, and for two days this apparently trifling wound poured out blood with a violence absolutely uncontrollable. At length he submitted to the operation, as the only means of saving him from bleeding to death; and from the clean incised wound thus made, not a drop of blood flowed, neither was it necessary to tie a single ligature. Very recently, in the case of a man whose arm was torn off by a steam-engine, the main artery of the limb hanging from the wound bled with a degree of violence that was nearly fatal before he could be conveyed to hospital."

Mr Porter points out very clearly the means which are adopted by nature, under the various circumstances of incised, punctured, contused, and lacerated wounds, to effect the stoppage of hemorrhage. That stoppage is temporarily effected by the retraction of the artery, and more especially of its internal and middle coats; the effusion of blood into the surrounding cellular tissue and between the coats of the artery; the formation of a coagulum in proper situations, and the increased coagulability of the blood according to the loss of blood. Such are the various means employed by nature to effect a temporary stoppage of hemorrhage; but to effect a permanent one, it is necessary that inflammatory action be excited in the wounded artery, and in the tissues surrounding it, by means of which lymph is effused, and a temporary closure is thus effected.

It is only the first of these two processes that can be imitated or assisted by art, and the methods which are followed to effect this purpose may be classed under the following heads:

1. Pressure by means of compress and bandage, or by mechanical instruments; 2. Pressure by ligature; 3. Pressure by torsion; 4. Pressure by the application of styptics; 5. Pressure by the formation of an eschar.

We shall quote our author's own words in the description of these means for stopping hemorrhage, as they afford a good specimen of the style in which the work is written, as well as the descriptive powers of its author.

"Whatever predilection a surgeon may entertain for the ligature, he, nevertheless, will meet many cases in which he will be disposed to try compression, and some in which he can have no other resource. Thus his business may be with a patient who has an unconquerable dread of the knife, and who will steadily refuse to submit to those incisions that are almost always requisite to expose a wounded artery, so that it may be tied with safety, or the wounded vessel may lie deep, or it may be of such size as to encourage a reasonable expectation of the bleeding not proving very profuse; or there may be nerves or other very important parts liable to be injured; or the accident may have happened at night, and in a situation where it might be impossible to procure light and the assistance necessary to the performance of a very delicate operation. I pass over cases where there may be reason to suspect a diseased condition of the vessel, and the still more dreadful cases of secondary hemorrhage, where the ligature had been already tried and failed. Independent of these, the recent cases are numerous in which a surgeon is obliged to trust to compression and bandage, and the success that occasionally attends this practice will appear surprising when the difficulties and dangers that accompany it are considered.

"If we reflect on the subject physiologically, it appears necessary, in order to the perfect compression of an artery, that the vessel should be small in size, and situated superficially, for if a strong muscle intervenes, its contraction will be sufficient to raise the compress, and allow the vessel to bleed internally.

"The artery should be upon a bone, so as to afford a counter-resistance to the pressure from without; there should be no accompanying vein, nor indeed any vein in the neighbourhood through which the current of blood could be intercepted by the compress. There should be no accompanying nerve, in a few words, the artery should be small and healthy, superficial, insulated, and resting on a bone; and a very slight anatomical reflection will show how few the arteries are that are so fortunately circumstanced. Even in the most favourable cases there are still some apparent difficulties. The compress and bandage ought to be applied so tight as to lay the opposite sides of the wounded vessel fairly in apposition, and in general this occasions such a degree of pain that few patients (once the actual terror of bleeding to death has passed away) will, or even can induce it. All bandages will stretch and become loose, the patient will shift about, and endeavour to alter its position and its bearing: and I have known one who actually took it off. If the bandage is too loose, it may not control the bleeding, or, what is worse, preventing it from appearing without. It may permit the vessel to bleed internally, and in a few hours the surgeon, summoned by the agonizing distress of his patient, finds the limb swollen; its cellular tissue in every direction injected with blood, and the entire limb ready to fall into gangrene. If, on the contrary, the bandage is too tight, and particularly in persons of bad habit and debilitated constitution, the pressure necessary to control the bleeding may occasion mortification of all the structures beneath it.

"Of all the arteries in the body the temporal has been justly considered to be that which may, with most safety, be entrusted to pressure, yet even here very calamitous results are by no means improbable. Soon after the application of the bandage the patient complains of intense pain; and when the dressings are removed, the integuments are found in a state of erysipelatous inflammation, threatening to run into gangrene, the wound opening, and the blood bursting out again. When (as I have unfortunately witnessed) the compression is reapplied, it only hastens the mortification without at all controlling the bleeding, and nothing that the patient can endure will restrain the hæmorrhage, which is profuse and often periodical, until that condition of constitution is established, known by the appellation of hæmorrhagic fever; at last perhaps the trunk of the artery is tied at a distance from the slough, and such an operation may succeed; but, in consequence of the freedom of anastomosis among the branches, is far more likely to fail. Thus harassed and broken down, pale, and exsanguine from repeated losses of blood, either the patient dies at an early period, or the foundation is laid for dropsy, consumption, or some other disease that will eventually carry him off. This is a sad picture of events, and sometimes unfortunately it is a true one, but not by any means so frequently as a mere theoretic reasoning on the subject might lead us to believe. In practice we find the treatment by compression tolerably successful, and that too in situations and under circumstances that might not always be anticipated."

It appears to us that our author does not sufficiently appreciate the valuable experiments of Jones. He says, "When a ligature is thrown round an artery, the first effect is to approximate its opposite sides." "When tied with a sufficient degree of tightness, the internal and middle coats are divided completely through." "This division of the internal and middle coats was held by Jones to be indispensable, inasmuch as when it did not occur, the artery failed to become obliterated in consequence of the absence of the process of inflammation." "In the human subject the internal and middle coats are so brittle, that it would be difficult to tie an artery without cutting them through; yet it is not necessary that this should happen. I have seen instances in which an artery was obliterated from the pressure of the '*presse artere.*" It is familiarly known that it may become so from compression artificially applied by means of a bandage; and the influence of tumours in the same way incontestibly proves that an artery may go through the entire process from inflammation to obliteration without its coats being so divided."

Jones was equally well aware with Mr Porter, that arteries become occasionally obliterated from pressure, in consequence of that pressure producing adhesion of the sides of the artery; and that Jones did not consider perfect division of the internal and middle coats of the arteries to be indispensable to their obliteration, may be drawn from the fact, that, in experimenting with broad ligatures, when the coats of the artery could be only bruised or partially cut through, the same results (viz. obliteration) followed as if the internal coats had been divided by a small round ligature; and, although Jones strongly recommends the perfect division of the internal coats, as producing more surely and speedily the required obliteration, he nowhere says that this is indispensable.

Mr Porter distinguishes aneurisms much after the method of Breschet, in the following manner; 1. True Aneurism, the pouch-like or saccular dilatation without laceration; 2. Circumscribed false

Aneurism with laceration of inner and middle coats; 3. Dissecting false Aneurism, when the blood is not contained in a sac but separates the external from the middle coat; 4. Mixed Aneurism, laceration and dilatation; 5. Diffuse Aneurism, including the Traumatic variety; 6. Aneurism, with destruction of inner coat only, and dilatation of middle and external; 7. Aneurismal Varix; and 8. Varicose Aneurism.

Mr Porter justly considers it of great importance to examine the causes which produce the different forms of aneurism; and especially that which may be regarded as spontaneous aneurism, or that from previous disease of the arteries.

The facts adduced by Mr Porter, which intimately bear on this subject, are the following:

"1. It is a disease unknown to early life, not (as far as I know) having been observed antecedent to the age of puberty; and although old age is not absolutely and completely free, it is comparatively rare at that period. From an aggregate of thirty remarkable cases operated on, I find the average to be thirty-three years and a-half.

"2. It is much more frequently met with in males than in females. This is remarkably proved in cases of internal aneurism, but still more so in the external. I have made the most extensive inquiries on this subject in my power, and can find but one surgeon in Dublin who ever operated for the cure of popliteal aneurism in the female.

"3. Arteries are liable to aneurism with a frequency nearly in proportion to their size, thus the most common seat of all is the aorta; and again, particular parts of these are more liable than others, aneurisms usually having their seats when the arteries are curved or bent, or when a branch may happen to have been given off."

It seems to be a prevalent opinion that laborious trades and occupations predispose to this disease, and, from the circumstance of the poor and working-classes being more frequently affected with it than the rich and idle; men being more frequently attacked by it than women; its occurring at that age when great bodily exertion is most required, and at those parts of the body which are exposed to the most severe exertion,—this opinion seems to rest on probable grounds. It may be said, too, that, reasoning *a priori*, and on physiological probabilities, it might be expected that those arteries which are most exposed to bruising, straining, &c. would be more liable to such injury to their tunics as would give rise to this disease.

On the other hand, it has been argued, and we find our author strenuously supporting the opinion, that physical exertion has nothing to do whatever in the production of this disease; that we find it more frequently among the labouring population than the higher classes of society, because the proportion of the former is much greater than that of the latter; that women are not so subject to it as men, while in the lower ranks the females labour and exert themselves as strenuously as any man, and certainly much more so than men in the better ranks of society. Mr Porter, in short, believes that bodily exertion has little to do with it, but that it is almost entirely to be referred to intemperance as a predisposing cause, or to that diseased state of the vascular system brought on by the abuse of mercury for the cure of syphilis.

Although we think that our author has been carried a little too far, in entirely leaving out of consideration, as a predisposing cause of aneurism, severe bodily exertion, it is, nevertheless, in our opinion true, that the chief predisposing causes, are, intemperance, especially in the use of spirituous liquors, and frequently repeated or ill conducted courses of mercury. Some of the older authors imagined that the condition of the arteries favourable for the production of this disease, was produced by the syphilitic poison. But mercury was so very extensively and largely used for the cure of syphilis at that time, that we agree with our author in thinking that it is more likely to be referred to the mercury than the syphilitic poison.

The chief predisposing cause, however, of aneurism, is no doubt intemperance; it produces a diseased condition of the arteries, according to our best authorities, (Dupuytren, Bouillaud, &c. and our author,) which, when once existing, the accessory cause of violent exertion at once comes into play, and aneurism is produced. This sufficiently accounts for the greater prevalence of the disease amongst the working community, and more especially amongst postilions, horse-boys, horse-soldiers, porters, miners, &c. These classes are well known to be notorious for constant drinking and general intemperate habits. It sufficiently accounts, also, for its more frequent occurrence in males than females. The circumstance, too, of its being unknown amongst the lower animals, shows that exertions, however violent, will not produce this affection unless during or after the arterial system is diseased.

Mr Porter makes mention of a fact which is new to us, and which we think is likely to turn out correct, "that few old persons are subjected to a course of mercury that do not perish shortly after by the bursting of a blood-vessel, of apoplexy, or hæmoptysis." If the statement should turn out to be well founded, it will go a great way to support the views of those who believe that mercury exerts a deleterious action on the blood-vessels.

Mr Porter very justly attaches no importance, as an exciting cause of aneurism, to that peculiar friable deposition which is so frequently to be found between the internal and middle coats. Its frequent occurrence in the arteries of old people, compared with the unfrequency of aneurism in those advanced in years, renders it very unlikely that this state of the artery has any effect whatever in its production, although it must interfere with the elastic properties of the artery.

That condition of the arterial system which is most productive of the disease in question is described at considerable length by our author. He prefers the division of inflammation of the lining membrane of the arteries into the healthy and unhealthy. "The healthy tends to the safety of the individual, the unhealthy too frequently to his destruction." As a specimen of the latter he relates the following illustrative case.

"Edward Lynch, aged 26, a shoemaker of intemperate habits, was admitted into the Meath Hospital, March 19, 1833.

"Ten days previously, he was seized with pain in the back and stitches in the side and chest, more especially towards the lower part of the sternum, in which latter situation he experienced a dragging sensation also. These symptoms continued without the supervention of any other during a week, when (on the 16th,) he felt soreness low down in the chest on swallowing solid food, which increased to great difficulty of deglutition on the following day; and since the 18th, he has taken no solids whatever, the attempt to do so always producing great pain and a sense of weight, followed at first by hiccup and then vomiting. Being desired to swallow a morsel of bread, he did so, and said it stopped in the passage. After repeated draughts of whey, it passed down, but not without a good deal of spasm, resembling hiccup. It was not vomited.

"On examination, the chest sounded well on percussion, and the stethoscope discovered no sign of disease in the heart or aorta. The action of the heart was a little stronger than natural, but the sounds were healthy; respiration feeble, but pure in the upper part of the right lung.

"This case was treated as one of dysphagia, so much so, that, on the 21st, I passed a probang down the œsophagus. I did not meet any decided obstruction, but was sensible of the instrument passing over a soft tumour. I recollect to have mentioned to some of the pupils the possibility of its being an aneurism, and the awful consequences that must result if the passage of the probang had chanced to rupture it.

"On the 27th, in the evening, he had an attack of cough and vomiting, in which he threw up about a pint of florid blood, and died immediately.

"*Dissection.*—The stomach was distended and of a dark colour; on opening it, a large coagulum of blood was found completely filling it. On slitting up the œsophagus, a clot much larger than a pigeon's egg, and covered only by the mucous membrane, was seen projecting into it. Its situation was nearly three inches from the cardiac extremity. The mucous membrane had given way in one spot, and thus was furnished the blood that filled the stomach, and which had been vomited. The pressure of this aneurismal tumour had occasioned ulceration on the surface of the œsophagus opposed to it.

"On opening the aorta, the pathology of aneurism, as connected with arteritis, was beautifully illustrated. The lining membrane was of a bright crimson or carmine colour, varied with small spangle-like patches, of a paler and more opaque tint. This vascularity resided principally in the lining membrane; for, on stripping off a portion of it, the fibrous tissue, although evidently inflamed, was much paler. The patches above-mentioned were caused by depositions of a soft white cheesy substance, which were either in the lining membrane, or between it and the fibrous coat; they came off attached to the lining membrane. There were three aneurisms in different stages of progression upon the aorta."

Mr Porter seems to have no doubt that the red appearance of the lining membrane of the aorta in this case arose from inflammation, and in subsequent passages, deduces from it several important conclusions. Now, although we are inclined to believe that arteritis is a frequent predisposing cause of aneurism, we doubt much if the redness here described by Mr Porter was really the result of inflammation.

Mr Porter nowhere mentions if there was any blood found in the artery. His silence on this point, and the general absence of this fluid in the arteries after death, would lead to the inference that there was no blood in the vessel; yet we think it possible that, as there were three aneurisms in the course of the aorta, they may have had the effect of keeping a quantity of blood in this vessel. One point is particularly deserving attention, according to the result of what we have ourselves observed. The inner surface of the aorta is always liable to be more or less tinged with blood after death. But whenever it is diseased, that is, rough, irregular, shrivelled, or tuberculated, from the deposit of steatomatous or osteo-steatomatous matter, then it is almost uniformly of a bright crimson red colour, which imitates closely the redness of inflammation.

We well know that redness of the lining membrane of the aorta is so deceptive a sign of inflammation, that few authors are inclined to place much confidence in it. Many other circumstances require to be taken into consideration. It is a frequent pseudo-morbid appearance in cases where the blood is unusually thin, or does not coagulate after death; it is so easily produced both in and out of the body by the simple contact of the blood, that, unless we have some other more decided result of inflammation along with it, we should be inclined to be very cautious in giving our opinion on it alone.

Now the patches of an opaque tint, which are mentioned to have been noticed in the aorta, may have been the result of a previous deposition of atheromatous matter. "The vascularity," too, "resided chiefly in the lining membrane, for on stripping off a portion of it, the fibrous tissue, although evidently inflamed, was much paler."

We would venture to state, that, if a gentle stream of water had been allowed to run over the lining membrane of the aorta for a short time, it would have soon removed the red colouring from it; and, besides, the condition of the fibrous and cellular coats renders our idea still more probable, because if it had been true inflammation of the aorta, the fibrous and cellular coats ought to have been extremely vascular throughout. Gendrin found in his experiments on the production of *arteritis*, that the internal coat exhibited a pale red colour, the middle a reddish-yellow, while the cellular sheath was minutely injected.

Although we do not agree with our author in thinking that the red appearance of the aorta arose from inflammation, this does not at all detract from the interest or importance of the case. It is, indeed, one of great interest, and must make a deep impression on the mind of every surgeon, in so far as the use of the probang is concerned, as it would have been truly deplorable if the probang had pierced the tumour and caused instant death.

In the prosecution of his subject, our author next considers internal aneurisms, by far the most common and most unexpectedly fatal of all the dangerous forms of this disease. We feel with our author "that it is awful to witness the bursting of an aneurism. Sometimes death is instantaneous, and seems to be the consequence of a single gush; but more frequently, as the detachment of the slough is slow, it separates first at the edge, and the blood oozes out, and a considerable quantity may be lost; but then in general the coagulum is forced into the aperture, and restrains the bleeding, or, perhaps, if the patient faints, controls it altogether for the time. Yet is this calm only for a few hours; the blood breaks out again and again; the patient sinks, becomes exsanguine and exhausted, and dies miserably in the course of three or four days." We can unfortunately corroborate the above account of our author regarding such miserable cases; it is, indeed, too true a picture.

"Aneurisms within the brain," says Mr Porter, "are and must be extremely rare." Aneurisms of the cerebral arteries are assuredly not frequent; but, from what we have ourselves seen, we are not prepared to admit that they are very rare. They do not, indeed, attain a large size, and they are not common; but the frequency of apoplectic effusions, and the little care which is bestowed in tracing such effusions to their origin, we have every reason to believe, is the cause of this supposition. We have seen them several times in the course of a few years, well marked, and all the cause of fatal apoplexy. Two of them existed in the anterior arteries of the brain, in the fissure of Sylvius. The arteries in both cases were diseased along their course, and the aneurismal swelling in the one case was about the size of a pea, while in the other it was a little larger. One other case, situated on the basilar artery, we remember of seeing, being present at the dissection. Mr Porter reminds us that we can have no other aneurism within the skull but the true, for, as there is no cellular sheath to the arteries, then the false variety is impossible. A good instance in the right vertebral artery is delineated by Cruveilhier (Livrais. xxviii. Pl. 3d.)

Our author goes on to detail the symptoms of thoracic aneurism; but we need not occupy space with the discussion here, as he advances nothing new on the subject, and allows that the diagnosis is in many cases extremely difficult, even although assisted with the stethoscope. Of this he relates an illustrative example.

> "In July 1837, I was requested by a professional friend to see a patient of his labouring under laryngitis, and, if I deemed it necessary, perform the operation of bronchotomy at once. It had been only of three days standing; the symptoms were dreadfully urgent and pressing, so much so, that I thought I had never met a more formidable case; and the idea of an aneurism never crossed my mind, as he had been attended by two physicians, one of them a most accomplished stethocopist. I proceeded to operate without delay, and some notion may be formed of the urgency of the case, when I state that I punctured the trachea with a trochar, rather than wait a few minutes, for the purpose of controlling some hæmorrhage that was present. After the operation, which afforded immediate relief, the patient was removed to the Meath Hospital, where he died suddenly in three days afterwards.
>
> "The case had been one of aneurism of the superior part of the descending aorta, which terminated by bursting into the left pleura; and, as the difficulty of breathing had been relieved by the operation, I imagined it at the time to have been produced by spasm of the glottis, occasioned by pressure on the recurrent nerve."

We could mention a similar case, in which the same operation was performed for the relief of supposed laryngitis, with equally unfavourable results, and others in which it was proposed to perform the same operation with the view of relieving laryngeal symptoms, evidently dependent on aneurism of the aorta.

One of the best chapters in the work before us is that on the treatment of aneurism. Some remarkable natural cures of aneurism have been recorded, but certainly none more so than one or two related by our author.

> "I am aware of a case," says he, "in which an aneurism had proceeded so far as to have caused absorption of the sternum. The tumour pulsated externally with a violence that threatened its bursting almost momentarily; the patient lay on his bed propped up with pillows, expecting nothing but the most miserable death; yet, without any obvious cause, and in despite of the prognostics of his attendants, the pulsation suddenly stopped, the tumour subsided, and he is not only alive, but strong and active at this moment."

The cure of this frightful disease is accomplished by nature in three ways.

> " *First*, By inflammation attacking the sac, thence spreading to the artery, and producing within it an effusion of lymph, and its consequent obliteration."
>
> " *Second*, By gangrene of the sac involving the artery, and blocking it up, just as mortification does elsewhere.
>
> " *Third*, By the growth of the tumour in such a direction as that a part of it shall come to press upon the artery above the aperture into the sac, and thereby perform the same office that a ligature placed on the same spot would be calculated to effect."

To trust to the natural means for the spontaneous cure of an external aneurism is now never dreamt of. It is only in those truly alarming and awful cases of internal aneurism that little or nothing else can be done, that we should be justified in doing what we can to assist nature in the process. This is to be effected by rest, abstinence carried as far as the safety of the patient will permit; quietude of mind, and the topical application of cold over the aneurismal tumour, when it can be accomplished. Our author's remarks on this subject are very appropriate.

> " But after all," says he, " there is nothing cheering in the management of these cases; they may be retarded in their progress, but still the fatal termination is but too inevitable; and if, in the chapter of accidents, some solitary case of recovery should fall out in the present state of our knowledge, it must be regarded as one of nature's efforts. Medicine and medical treatment can claim but little share in the occurrence.
>
> " But not so with the external forms of the disease; they are within the reach of operative surgery; and if there is any one thing more than another to raise this branch of the healing art to the eminent station in public opinion it ought to possess, and, moreover, any one in which the labours of British surgeons have been rewarded with a more than ordinary degree of success, it is this one.
>
> " It is not very long since an attack of aneurism was nearly equivalent to the patient's death-warrant. But a few years have elapsed since the treatment of the disease was so indifferently and imperfectly understood, that, if all the afflicted did not die, certainly but few recovered. We now, however, propose an operation with confidence, and generally perform it with success."

Diffused aneurism, according to Mr Porter, may exist practically under two very different forms, arising under the circumstances of an external wound or not. An artery may be wounded by the rough fragment of a broken bone, or by the irritation or actual puncture of a sequestrum in necrosis; or the sac of a circumscribed aneurism may be ruptured without any external wound existing in the other, when there is an external wound so leading down to, and communicating with, the injured artery, as to permit the escape of a portion of the blood from it.

Mr Porter has enumerated several points of great practical importance with regard to this kind of aneurism, to which we shall shortly refer.

In all cases of this disease there is great danger; and this arises from two circumstances,—the loss of blood, and the presence of the blood in the cellular tissue inducing mortification, this latter peril being always in proportion to the extent to which the diffusion has reached. Occasionally, too, bleeding is at first restrained by being bound down by a fascia, but, upon this giving way by sloughing or otherwise, immense effusion of blood takes place into the cellular tissue, which rapidly proves fatal. Mr Porter has related a most instructive case of this kind, which, although our space is limited, we shall shortly relate.

A poor man received a blow on the leg by the falling of a crate of glass on shipboard. He came to the hospital complaining of deep and dreadful pain in the limb; but, on examination, there was nothing abnormal to be found; no swelling, discoloration, tenderness, or lameness, and consequently very little attention was given to the case. In this state he went about during a space of six weeks, from one institution to another, regarded at some as a hypochondriac; at others, perhaps, as an impostor; but at all completely overlooked. At the end of that time, he experienced a sensation as if something had given way within his leg, which immediately began to swell, and ran so rapidly into gangrene, that amputation was performed on the following day. He died, and on dissection, the posterior tibial artery was found ruptured.

Our author considers the wounded and bleeding artery in a case of diffused aneurism a point of secondary importance to the quantity of effused blood in the cellular tissue; at least in coming to a conclusion as to the line of treatment. The quantity of effused blood may be too great to render it possible to save the limb; and even although an attempt be made to save it under such circumstances, the blood most probably will act as a foreign body, and putrefy, abscesses and profuse suppuration will result, which gives the patient a much worse chance of life than if primary amputation had been performed. All circumstances, therefore, must be taken into consideration, as well as the age, habits, strength, and constitution of the patient; the general state of the circulation; the probability of secondary hemorrhage occurring if the artery is tied; the kind and size of the aperture in the bleeding vessel, &c. &c. before a decision be come to whether or not an attempt is to be made to save the limb.

Our space forbids us entering further into the details of this chapter, which we think by far the best in the part of the work before us.

We do not find our author making mention of the subject of osteo-aneurism,—an important though rare disease, and one which ought to be noticed in a work like the present.

It will be seen from the preceding observations that we think highly of Mr Porter's work. As was to be expected, the author shows perfect familiarity with the pathological history and relations of aneurism, and illustrates the leading points with much ability. It is desirable that he should complete his treatise as speedily as possible, as, in its present shape, it is less instructive to the reader than, we are certain, it will prove when completed.

ART. IV.—*Letter to the Right Honourable George, Earl of Aberdeen, K.T., &c. &c., Principal Secretary of State for Foreign Affairs, Chancellor of the University and King's College, Aberdeen, on the State of the Schools of Chemistry in the United Kingdom.* By WILLIAM GREGORY, M.D., F. R. S. E., M. R. I. A., Professor of Medicine and Chemistry in the University and King's College, Aberdeen. London, 1842. 8vo. pp. 35.

THIS letter, which is extremely judicious and well-written, relates to a subject of great importance to the improvement of the chemical arts in this country, and to all those branches of industry which depend on these arts. The object of the author is to impress on those concerned in the government, the necessity of establishing efficient schools of practical chemistry in the universities, and in other situations in which circumstances show that such establishments are required.

We take it for granted, in the first place, that the cultivation of practical chemistry is of the most essential importance to this country, and, indeed, to every country in which chemical processes enter so largely into the different manufactures. All branches of science require to be cultivated practically and experimentally by those who wish to obtain a thorough knowledge, either of their principles or of their practice. But there is no branch, perhaps, which so urgently and so constantly demands this as that of chemistry. Though it has, like all others, its principles and its theory, yet these depend so intimately and necessarily on experimental researches, and are so incessantly undergoing changes and modifications in consequence of new facts, that it is quite impossible to think either of teaching chemistry efficiently, or cultivating it successfully without ample means and accommodation for the cultivation of the practical department.

We have said the necessity of establishing efficient practical schools; and, perhaps, it may be answered, are there not practical schools in Edinburgh, Glasgow, and similar places?

It may be admitted that there are in these cities something like practical schools for communicating the simplest and most elementary chemical principles; but there is no establishment, so far as we know, which is entitled to the character of an efficient practical school, and none which affords the student the means of becoming an intelligent and accomplished chemist, equally imbued with correct scientific views, and expert, and ingenious as an experimental analyst. When we thus express ourselves, we do not mean to underrate the merits of the ingenious cultivators of experimental chemistry, who have lately sprung up amongst us. These have arisen, not in consequence but in spite of facilities for cultivating the art; and they would have been more numerous had the facilities been greater and more complete.

It is indeed more wonderful that any good experimental chemists have arisen in this country, than if they had not appeared at all; since not only are there no suitable and adequate provisions for the study of the science, and those who chose or had a taste for such pursuits, had to obtain the requisite knowledge in a scrambling and irregular manner, but by practical chemistry being made a sort of appendage to the education of the physician and apothecary or druggist, who also ambitiously enough styled himself chemist, it was taught and studied solely with reference to the necessities of these two classes of individuals. Chemical knowledge is doubtless very important to the physician and apothecary; but it must be allowed that it is not less so to many other professions; and unless the art be taught in a general mode, with reference to the necessities of all those individuals and classes of individuals who require its assistance, it is clear that it never can be taught in a useful and efficient manner.

Dr Gregory shows that he understands most completely, and estimates most justly, the great advantages resulting from a more general and a more perfect and elaborate cultivation of practical or experimental chemistry. He shows that, by superior knowledge in this department, the commercial and manufacturing prosperity of nations may be influenced in a most material degree; and that in particular emergencies, when commercial restrictions have prevented them from obtaining by commerce various articles required in manufactures and the arts, the happy application of chemical knowledge has not only defeated the schemes of their foes, but tended to enrich the nation whom they were intended to distress and ruin.

One of the most beautiful and apposite examples of this, the discovery of the mode of decomposing muriate of soda to obtain carbonate of soda by M. Leblanc, in 1814, during the commercial restrictions imposed on France and Spain by the blockade of the British fleet, is detailed as an illustration of the principles which he studies to inculcate; and it is so pregnant with results that it deserves to be noticed. The author allows that he has been indebted for his illustrations to an anonymous article in the Allgemeine Zeitung; but this does not detract from its intrinsic value.

"The first great stimulus to the improvement of the manufacture of sulphuric acid was given by the announcement of a prize of 1,000,000 francs (L. 40,000), offered by the Emperor Napoleon for the discovery of a simple and cheap process for extracting soda from sea salt. Soda, as is well known, has been used, from time immemorial, for the manufacture of soap and glass, two products of the highest value to mankind. Indeed, the use of soap is so essential to comfort, that the quantity of soap consumed by any people may be viewed as a direct measure of the degree of civilization and happiness they enjoy. Its use depends on the feelings of comfort, nay, on the sense of the beautiful, which are inseparable from cleanliness. Where these feelings prevail, there, we may be sure, civilization and happiness are to be found. The princes, counts and barons, the rich and powerful in the middle ages, who concealed with costly spices and odours the offensive exhalations of their skin and of their clothes, which rarely came into contact with soap, indulged, it is true, in greater luxury in their sumptuous feasts and splendid dresses than their descendants in modern times. But how vast is the difference between their days and ours, in which personal filth has come to be synonymous with absolute misery!

"It is to glass, again, that the poor man owes the inestimable blessing of the free admission of light to his dwelling, even in the coldest climate. It is not easy to exaggerate the value of these two products, soap and glass, to mankind. During the war, France was deprived of her accustomed supply of barilla (the usual source of soda) and of soap from Spain, the ports of both countries being watched by the British fleet. The high price of soda, soap and glass, consequent on this state of matters, led to the offer of the prize above-mentioned; and the problem was solved by the French chemist, Leblanc, who furnished a cheap and simple process for extracting soda from sea salt. France soon supplied herself at a cheaper rate than before; manufactories of soda, soap, and glass, arose and flourished; and the bitter feelings excited among the Spaniards by the permanent loss of a lucrative trade were not without their influence in bringing the Peninsular war to a fortunate conclusion, and in hurling Napoleon from the imperial throne.

"Such were the immediate results of Leblanc's discovery; but it is painful to add, that he never received the reward he had so well deserved. The restoration occurred in the interval; the new government had more pressing debts to discharge; and it is understood that the claim has now been shut out by prescription. Let us now consider the nature of Leblanc's process.

"To convert salt into soda, the first step, according to this process, which is now, with some modifications, uniformly followed, is to convert the salt into sulphate of soda. This can only be done by means of sulphuric acid, of which 80lbs. are required for 100lbs. of salt. Hence, one of the first effects of Leblanc's discovery was, to create a very large demand for sulphuric acid. It is obvious, that, as soon as the government, by reducing the duty on salt, reduced its price to a minimum, the price of soda became dependent on that of sulphuric acid. This circumstance, together with the extensive demand, and the large profits realized by the makers of sulphuric acid, turned the attention of men of science to the improvement of this latter manufacture; and every year produced some new amelioration, while the price of the acid steadily fell, and the demand for it as steadily increased. Its formation was studied by the most accomplished chemists, and brought by degrees to its present nearly perfect state.

" Sulphuric acid is made in vessels, or rather chambers, of lead, and so large is the scale of operations in some manufactories, that one of these chambers would contain with ease a middle-sized house of two stories. So nearly does practice in these great manufactories approach to theory, that 100lbs. of sulphur, which, by theory, should yield 306lbs. of sulphuric acid, do actually yield 300lbs.

" In this manufacture, the price of the product depends partly on the apparatus, partly on the price of the materials, sulphur and saltpetre; and in both, a great reduction has been effected. Till lately, the plates of lead, of which the chambers are formed, were soldered together with difficulty, by means of lead, no other solder being able to withstand the action of the acid. The operation of soldering cost nearly as much as the plates themselves; but now that the oxy-hydrogen blowpipe is used for the purpose, the expense is a mere trifle, while the operation is so easy, that a child may perform it. Again, the acid was formerly concentrated in enormous glass retorts; these were exposed to breakage, occasioning heavy loss, and destroying the furnaces; vessels of platinum are now used for concentrating the acid, and although these sometimes cost from L. 1,000 to L. 1,500 a piece, they are found, from their durability, to be a source of economy, and have materially contributed to bring about the very low price of the acid: moreover, it is the demand for platinum for such vessels that alone renders profitable the working of the Russian mines of that metal. We may see by this, how every discovery acts in many different ways, and always advantageously.

" When economy had been pushed thus far in the apparatus, the price of the materials became a point of more importance than previously; that of nitre was so high, as to stimulate the manufacturer to search for some substitute, which was speedily found in the nitrate of soda, enormous beds of which cover whole plains in South America. This salt is much cheaper than saltpetre, and preferable to it for the manufacture both of nitric acid and of sulphuric acid; but, besides the direct effect of cheapening these acids, the introduction of nitrate of soda, by limiting the use of saltpetre to the making of gunpowder, for which nitrate of soda does not answer, has produced the indirect effect of cheapening gunpowder, the price of saltpetre necessarily falling as the demand for it diminished. This must be, in time, a material source of saving to governments.

" Finally, with regard to the chief material, sulphur, on which the price of sulphuric acid now principally depends, it is well known that our manufacturers derive nearly their whole supply from Sicily, so that Naples may be said to possess a monopoly of that article. That the trade in sulphur is highly important to both nations is obvious, when we reflect on the enormous quantities of sulphuric acid now manufactured in Britain alone. A small manufactory will produce from 250 to 300 tons annually; a large one 3,000 tons, or more: it is no wonder, then, that the late interruption to the trade in sulphur caused great uneasiness among our manufacturers; but it had another effect: the attention of chemists was keenly directed to other means of procuring sulphur, and, during the period of obstruction to the sulphur trade, it is said that no less than fifteen patents were taken out in England for recovering the sulphur from the sulphuric acid used in the soda manufacture. The restoration of the trade to its accustomed channel has postponed the accomplishment of this object; but the impulse has been given, and Naples may ere long find good cause to regret that she ever allowed any obstruction to the trade in sulphur. We have whole mountains of gypsum and heavy spar, and abundance of pyrites and galena, all of them minerals containing sulphur, which we shall one day find the means of extracting economically; indeed, during the period above alluded to, many tons of sulphuric acid were actually made from iron pyrites. When we consider the resources of modern chemistry, it will not appear improbable, that, if the sulphur trade had been obstructed for a year longer, it might by this time have been lost to Naples for ever.

"These considerations are of themselves sufficient to show that the manufacture of sulphuric acid has become a matter of national importance, were it only on account of its use in making soda; that alkali is now sold in a state of perfect purity, and at a wonderfully low price, so low, indeed, as almost to have put an end to the use of potash. The quality of glass and soap has been very much improved, and their price greatly diminished; the consumption of both articles has naturally increased in a corresponding ratio. Wood ashes, no longer in demand to nearly the same extent as formerly for manufactures, must also fall in price, and will soon be employed as one of the most powerful manures for our wheat fields."—Pp. 3—8.

Dr Gregory then adduces various other illustrations of the happy application of chemical knowledge in effecting economical improvements in different arts, for instance, the abridgement of the time and the saving of expense in bleaching by the use of bleaching powder, and the employment of sulphuric acid in separating silver from gold. He then proceeds to explain the necessity of establishing, in suitable situations, practical schools, with suitable accommodations, and a proper supply of apparatus and instruments for performing experiments of different kinds. As a model, he adopts the laboratory of the University of Giessen, planned, built, and furnished under the superintendence of Professor Liebig. He explains at as much length as possible, the probable expense of such an establishment, and shows the beneficial results on the improved state of chemical knowledge in Germany, as shown by those who cultivate the different arts in which chemical operations are requisite.

We recommend strongly the perusal of this ingenious and well-written tract to all those who take an interest in the progress of science and its applications to the useful arts. We see in it nothing chimerical or impracticable, and we think it reflects great credit on the author.

ART. V.—*A Dispensatory, or Commentary on the Pharmacopœias of Great Britain ; comprising the Natural History, Description, Chemistry, Pharmacy, Actions, Uses, and Doses of the Articles of the Materia Medica.* By ROBERT CHRISTISON, M. D., F. R. S. E., Professor of Materia Medica in the University of Edinburgh, &c. Edinburgh, 1842. Pp. xliv. and 978.

WHEN Dr Lewis published in 1754 his New Dispensatory, it consisted of a short system of the Theory and Practice of Pharmacy, a system of Materia Medica, or what the author styled Medicinal Simples, arranged in alphabetical order, and a translation of, and Complete Commentary upon, the London and Edinburgh Pharmacopœias. This work became very popular, and in the course of thirty years went through seven large editions, in each of which it received successive improvements. After the death of Dr Lewis, an Edinburgh New Dispensatory was published with great improvements, corresponding to the progress of chemical and pharmacological knowledge, first, in 1785 by Dr Webster, then in 1786 and 1788, by Dr Duncan, Senior, and lastly, in 1794 and 1797, by Dr Rotheram.

A new edition of the Pharmacopœia of the Edinburgh College, in 1800, along with other reasons, required the appearance of a New Dispensatory; and this was accordingly accomplished in 1803, by Dr Duncan, Junior, with many improvements, and much of that accurate pharmacological knowledge, which afterwards, in twelve successive large editions, invested this work with so high a degree of reputation, and rendered it so extensively popular.

To the late Dr Duncan, Junior, belongs the merit of first fixing the art of pharmacy upon the solid foundation of chemical knowledge, and directing the attention of physicians and pharmacologists to the necessity of studying not only the natural history, but the physical and chemical qualities of the articles employed as medicinal agents. With this view, he introduced, as preliminary to the Commentary on the Pharmacopœias, a short epitome of Chemistry and the Elements of Pharmacy, more in accordance with the state of chemical science at that time than in any previous Dispensatory, and a Treatise on Materia Medica, almost entirely new, in which he swept away with a bold and unsparing, but judicious hand, many inert and absurd remedies, which had been suffered to remain through indolence and the spirit of imitation, and in which he gave ample and correct descriptions of the natural, commercial, and medical history of the various simple substances employed in the preparation of medicines, and the treatment of diseases. This was arranged for the sake of convenience in the alphabetical order.

The Dispensatory of Dr Duncan, Junior, as it was thus most justly entitled to be called, very soon, from its convenient arrangement, which admitted of easy consultation, became generally read, and from the accuracy of its information, a book of high authority. This was most unequivocally evinced by the many imitations both in this country and abroad, and by the numerous channels and varied forms in which its materials were reproduced. In the meantime, so assiduously did the learned author exert himself in keeping it on a level with, if not in advance of, the chemical and pharmacological science of the day, that in rather less than twenty years, the work went through ten large editions; and, while it stood at the head of all works on the same subject, being studied with equal diligence and avidity by the physician of long experience, and the apothecaries' apprentice, it had lost all resemblance, except in one particular, to the original prototype by Dr Lewis. In the eleventh and twelfth editions, the last published by the accomplished and indefatigable author, this was remarkably the case; and, as after the publication of the former, the excellent critical remarks of MM. Chereau and Robiquet had appeared, and had been published separately with observations by Dr Duncan, so in the last he had embodied all the rectifications and improvements suggested by these skilful pharmacologists.

It is curious to contemplate the successive advancements of this valuable work. In 1800, Dr Duncan began, we think, with a distrust in his own powers for such a task, to compile a Dispensatory on the model of that which had already taken the professional taste so strongly in the hands of Dr Lewis, and afterwards of Dr Webster, Dr Duncan, and Dr Rotheram. The experiment had been successful, and therefore Dr Duncan, Junior, thought it unsafe to deviate at first too far from the standard. He eventually, however, did deviate from it considerably, without in any manner impairing the popularity of the work, and rendered the work entirely his own.

It often occurred to us that Dr Duncan might most justly have written a Dispensatory altogether new, without fettering himself in any mode, either by the example or the materials of his predecessors. This would only have been doing at once what he was compelled to do by progressive steps, and what he ultimately did in the height of his reputation and authority. In one respect, Dr Duncan seems never to have entertained the thought, that it was possible to get rid of the separate Commentary on the Pharmacopœias, or to introduce their materials in the Materia Medica; and perhaps he believed that the publication of these works in the Latin language, and the consequent necessity of a translation for the apothecary and his assistants, presented an insurmountable obstacle to so great an innovation. It cannot be denied, nevertheless, that this separate commentary, which formed the third part of the work, must have been a fertile source of repetition, and must have taken away largely from the unity of the work. There is further no necessary reason for such a separate commentary; for all the officinal preparations, the theory of their composition or decomposition, their pharmacological history, and every thing relating to them and their uses, might, with perfect facility, have been introduced under one head or other of the articles in the Materia Medica.

To take, for instance, the article Sulphuric acid, the commercial and chemical history with the medicinal uses of that substance, with an enumeration of the officinal preparations and all the compound articles into the composition of which it enters, is first given in the Materia Medica department; and then a little more of the chemical history with some chemico-pharmacological details, and another enumeration of officinal preparations are given in the Commentary; and next follows the article Dilute sulphuric acid, and, finally, at a great distance among the tinctures, Aromatic sulphuric acid.

It appears that all the chemical and pharmacological history of this substance, with the requisite comments on its preparation, its pharmacological uses, its direct officinal preparations, and its medicinal uses, might have been given under one single head in the Materia Medica Department. This practice would, it appears to us, have given the work a greater appearance and degree of unity, and would have had the further advantage of furnishing the reader with a full view of the whole of one subject under one and the same head.

Again, neither of nitric acid nor of muriatic acid is there any mention made in the Materia Medica Department; and the points deemed requiste in their commercial, chemical, and pharmacological history, with their applications in medicine and surgery, and their officinal preparations, are delivered only in the Commentary on the Pharmacopœias. To us it always appeared that no very good or satisfactory reason could be assigned for this mode of arrangement; and all that was needful of both these articles might have been stated in the Materia Medica Department. The same remarks are applicable to many other articles, the histories of which are delivered under two separate heads.

From what has now been said, it need not seem wonderful if we think it both fortunate and judicious that Dr Christison has at once thrown aside this mode of publication; and has written a Dispensatory altogether new, and upon the plan now specified. In the arrangement of the work, indeed, Dr Christison has introduced two changes, which must be regarded as essential improvements. In the first place, he has prefixed no introduction on pharmacy, for the obvious reason, that it is quite impracticable, in the present state of pharmacological knowledge, to explain the principles and rules of that art in sufficient detail and fulness, in order to make them useful to the pharmaceutist, without encroaching more on the proper subject of the work, than could be compensated by any advantage thus obtained. In the second place, Dr Christison has abandoned the third part of the old Dispensatory in form, though not in substance, namely, the Commentary on the processes of the different Pharmacopœias. In other words, he has introduced the pharmaceutic processes given in each Pharmacopœia, and all the requisite comments, observations, and explanations, with the list of officinal preparations, under the respective heads of each article in the Materia Medica. This, he was partly enabled to do by the circumstance of the Pharmacopœia of the Edinburgh College being published in the English language, which, of course, superseded the necessity of a formal translation.

These changes must be regarded as very great improvements. The first has enabled the author to devote to the proper and legitimate subjects of his treatise a much larger space than he could otherwise have done; and he has consequently given of many parts much more ample and correct details than are found in any previous treatise on the same subject.

By the second the author has given his work a much more decided character of unity, and, we may add, of methodical arrangement; and he has thereby succeeded in rendering it as it were at once an instructive system of Materia Medica and a continued commentary on the Pharmacopœias.

It must not be supposed either that by thus excluding the part which usually forms the third in the dispensatories, Dr Christison has neglected to introduce the processes or rules for preparing each officinal article or medicine. We shall see presently that this has been properly provided for, and that it has been accomplished in a very simple manner with great saving of space and time.

The present work may be described as a Commentary, historical, chemical and pharmacological and therapeutic on the three British Pharmacopœias, on such a plan and in such a manner as to form a useful and comprehensive system of Pharmacy and Materia Medica. It is preceded by an Introduction on some General Processes in

Pharmacy, in which the author makes some short but necessary explanations regarding the rules to be followed, and the precautions to be observed in the preparation,—of Acids, or in manipulations with them; of Alcohol and the Ethers; of the Vegetable Alkaloids; Conserves, Electuaries, and Confections; Decoctions; Distilled Waters; Enemata; Extracts; Officinal Honeys; Infusions; Metals and their Compounds; Mixtures and Emulsions; Ointments, Liniments, and Cerates; Pills; Powders; Spirits impregnated with Volatile Oils and other Aromatics; Syrups; some leading Tests; Tinctures; Troches or Lozenges; Vegetable Extracts in general; Vinegars; Volatile Oils; and a concluding Article of some length on Weights and Measures. In the course of this introduction, Dr Christison gives sufficiently detailed explanations of those forms of chemical or pharmaceutical apparatus, which, his multiplied experience has taught, are the most convenient and applicable for the purpose.

This introduction is followed by the main body of the work, in which, under the title of Materia Medica, Dr Christison gives ample, comprehensive, and accurate descriptions of every article placed in the lists of the three British Pharmacopœias. The order observed is alphabetical, for the sake of facility in reference. The mode in which each article is described is the following—varied as the article is a vegetable, a metallic substance, or the result of manufacture.

First, the name of the article and its denominations in the different Pharmacopœias are given; then come the processes for the various officinal preparations. If a vegetable substance, the preparations in which it forms a part, or which are made from it, are specified, and the processes mentioned. If a manufactured article, and if the directions are given in the Pharmacopœia, these are shortly set down; if the process be not given, it is described in the chemical history of the substance. Then follow shortly the synonymous appellations of the article in the different languages of Europe, and in several of those of Asia.

Next to this comes the general history of the agent or substance, the mode of preparing it, and the uses to which it is to be applied. The mode in which this is done varies according to the nature of the article.

In regard to chemical agents prepared by chemical processes or manufacture, a similar plan, modified according to the peculiar circumstances of the article, is observed. First is given the designation of the article in the Edinburgh, London, and Dublin Pharmacopœias. Then follow the tests for determining its purity. Next come the processes or methods of preparing the article according to the directions of the several colleges. Then come the officinal preparations or modifications, with the synonymous terms in different languages. All this is preliminary to the historical and chemical description of the article.

This is commenced with some short general notice of the article, its nomenclature, if requisite, its introduction into the art of Pharmacy, and similar matters. Then are given, under the head of chemical history, a full detailed account of the mode or modes in which the substance is prepared, according to the directions of the different colleges, explanations of the reasons of the mode pursued by each, observations estimating the comparative advantages of each, and determining, if possible, the superiority of the most eligible, and all the points illustrating its chemical and pharmaceutical properties. Then come remarks on the impurities and adulterations, their causes, whether accidental or intentional, and the best methods of detecting them. This is followed by the account of the actions of the agent and its uses in medicine and surgery, the form and mode in which it is employed; and lastly, the officinal preparations, and the doses of each.

Such is a general account of the method in which the histories of the different articles are treated. Regarding the mode and style of their description, they are exactly what they ought to be in a didactic treatise designed for general use and speedy reference; minute, accurate, and precise, without being tedious; short and pointed, yet always perfectly sufficient, and throughout instructive and interesting. It is manifest throughout the whole course of the work that the author has taken great pains personally, and performed multiplied accurate experiments, in order to rectify popular and sometimes unsuspected errors, to supply accurate knowledge where information was previously vague, and to fix the whole science of Materia Medica and Chemical Pharmacy on as stable and positive grounds as the circumstances admit. To specify any particular articles or portions of the volume in which these qualities are evinced is impossible. They are manifest in every article, and in all those that are most important. We know, indeed, that the author has been most assiduously occupied for ten years, at least, in procuring from all sources information which might render this work as ample, as comprehensive, and as accurate as possible; and we are confident the profession will not be disappointed by the results of his endeavours.

While Dr Christison has been thus indefatigable personally, he has not neglected the labours and services of his predecessors and contemporaries. A high and well-merited eulogium is pronounced on the labours and literary and scientific researches of his excellent and lamented predecessor in the chair of Materia Medica; and to us who know how well this panegyric is earned, and the ability as well as caution and discrimination of the judge by whom it is pronounced, it acquires a value infinitely superior to all other commendation.

In the frequent reference to the labours of naturalists, botanists, chemists, and pharmacologists, Dr Christison has conferred additional value on his own work, by specifying those sources of information upon which most reliance is to be placed.

In conclusion, we have only to say, that this work fully realizes our own expectations, and makes us feel that it has already taken its place at the head of all the works on the same subject, both as to the authority of its information and its general usefulness.

We have heard it urged as an objection to this treatise, that it contains no posological table. The objection appears to us trivial and unimportant. The average doses of each medicine and medicinal preparation are given at the end of each article respectively, and may there be as readily found as in one separate table. We do not mean, nevertheless, to deny the utility of a posological table, though we think it is almost impracticable to construct one which can be universally useful; and we have repeatedly found that doses were stated in some tables in some instances too small, in others too large. Perhaps, however, the learned author may take this matter into consideration in his next edition; and, if it appears expedient, he may remove this small objection, and render his work universally acceptable by the introduction of such a table.

ART. VI.—*A Practical Treatise on Auscultation.* By M. BARTH, M. D., and HENRY ROGER, M. D. Translated, with Notes, by PATRICK NEWBIGGING, M. D. Ed., F. R. C. S., &c. Edinburgh, 1842, 12mo. pp. 398.

OF the original of this treatise, when it first appeared, we gave a short notice in our fifty-fifth volume; and at that time recommended it to the particular attention of medical readers, as an excellent exposition of the art of auscultation and percussion in all its applications.

We have great pleasure in introducing to the notice of our readers the present English translation, which has been done with much ability, good taste, and judgment. Dr Newbigging has the advantage of having carefully studied the phenomena of Mediate Auscultation, and has consequently been enabled to translate the work of MM. Barth and Roger, not as one who translates words only, but as one who transfuses the language and the ideas of his authors. We are pleased also to find that he has not half-done his work, by introducing, as too many now do, French technical terms, to save themselves the trouble of using and finding the corresponding English denominations. Such a mode of procedure is not translation. The English language is certainly not deficient in expressiveness and in multiplied terms corresponding to similar and identical terms in other languages; and the great duty of the able translator is to avail himself judiciously of these. This Dr Newbigging has done; and we have no doubt that his translation will be perused with pleasure by all who wish to read good English.

Dr Newbigging has added a number of very judicious and instructive notes, and he has also introduced all the most important facts and doctrines of Dr Skoda.

The work is, in its present shape, a most useful and instructive guide to the student.

Art. VII.—*Principles of Surgery.* By James Syme, F. R. S. E., Professor of Clinical Surgery in the University of Edinburgh, &c. Third Edition, enlarged, and illustrated with 64 Woodcuts and 14 Plates. London 1842, pp. 508.

Of this work we have already, on two former occasions, given some account in the thirty-seventh and forty-seventh volumes of this Journal, (p. 485.)

The present edition, which is the third, is enlarged and illustrated with many woodcuts and fourteen engravings. These illustrations have doubtless enhanced much the value of the work. The woodcuts are principally employed in illustrating certain peculiarities, anatomical or pathological, of the diseases and injuries of which the author treats; and this they do extremely well. Thus, under the head of diseases of the arteries are given very useful views of the appearances of arteries obstructed by lymph; of an aneurism of the Sylvian artery, in the brain; of the coagula contained within aneurismal sacs; of the anatomical peculiarities of false aneurisms; of aneurism cured spontaneously by the obliteration of the vessel; of aneurism by anastomosis; and of the case of varicose aneurism affecting the aorta and the *vena cava,* formerly described by the author in the thirty-sixth volume of this Journal (p. 103); and in the eleventh chapter, on the injuries and diseases of bones, are given some excellent and correct delineations of such diseases of the bones, as chronic periostitis, necrosis, *spina ventosa,* caries, exostosis.

Of the plates, which are lithographed, a few are devoted to instruments recommended and employed by the author. The majority are employed in illustrating the appearances of several diseases of the bones, the nature of which could not probably be so easily or perfectly illustrated by woodcuts. Thus we find very correct views of the appearances of bones affected with necrosis, with *cloacæ,* and sequestra; figures illustrating the repair of bone in the lower animals; and views of the external aspect and internal structure of different sorts of exostosis of the lower jaw, and of the fibro-cartilaginous tumours of the cylindrical bones. These engravings are done with great ability.

These illustrations have doubtless contributed much to render this work useful to the student and practitioner of surgery. We formerly recommended it as an excellent treatise on the Principles and Practice of Surgery, presenting correct views on all the essential points in the pathology of those diseases coming under the management of the surgeon, and enabling the student to understand the reasons of treatment and operative measures. This character it still ably sustains; and it may with confidence be recommended to the surgical student as an excellent didactic treatise for initiating him into the Principles of Surgery.

PART III.

MEDICAL INTELLIGENCE.

ANATOMY AND PHYSIOLOGY.

On the Elastic Vertebral Apparatus, which is the chief means of maintaining the Erect Position. By M. Deschamps. (*Comptes Rendus des Séances de l'Academie des Sciences*, December 1841.)—The series of yellow intervertebral ligaments compose the system which M. Deschamps designs by the name of the elastic vertebral apparatus. This elastic apparatus is perfect in man, and is formed by a continued series of yellow ligaments in the interior of the spinal canal, which unite together the vertebral laminæ. It commences between the atlas and the axis, and terminates by joining the last lumbar vertebra to the sacrum.

Of all the Vertebrata, man alone has this structure complete; it is broken up and limited to certain regions of the spine in all the other Mammalia, and in Birds; its nature is changed in a great number of the vertebrated animals.

When the elastic apparatus consists of a structure simply composed of white pearly fibres, the spinal column has always a horizontal position, the animal is essentially quadruped. The Carnivora, the Pachydermata, and the Ruminantia are examples of this form of organization. The reptiles and fishes have equally a horizontal spinal column, and are provided with an intervertebral structure deprived of yellow ligaments.

Whenever the vertebral column possesses a continued series of elastic ligaments, it assumes a direction perpendicular to the line of the horizon. Thus the whole class of Rodentia assume by preference a sitting posture during eating, the lower part of their spinal column being perpendicular, the cervical and dorsal regions forming an arch bending forwards. In this class the yellow elastic ligaments are only found in the lumbar region; the rest of the column has only white fibrous ligaments. The horse, which alone of quadrupeds keeps its head elevated, is provided with this elastic apparatus in the cervical region, all other animals have it not, so their head hangs or is on a level with the rest of the spinal column. Birds, like the horse, keeping their neck upright, are provided with this apparatus in the cervical region; the rest of the spine being horizontal, is unprovided with it.

Man is, therefore, by his organization, formed to assume and maintain the erect posture. His natural posture is the erect, not the horizontal. The fœtus *in utero* is unprovided with this elastic yellow ligamentary apparatus at first; it is only gradually developed, first in the lumbar region, and then gradually extends to the atlas. As this apparatus becomes developed, the spine, which had a perfectly straight position, becomes curved as it is seen in after life, and this change begins to be effected from the moment of birth.

On the Structure of Mucous Membranes. By M. Flourens. (*Comptes Rendus des Séances de l'Academie des Sciences*, 29th November 1841.)

—M. Flourens, by means of long-continued maceration, succeeded in separating and exhibiting in distinct layers the component layers of mucous membranes. He found them to be composed of three superimposed laminæ,—the exterior, which was also the thinnest, consisting of the epithelium, below which lay the mucous layer, the lowest of all consisting of the true dermoid tissue. When these layers were exhibited by the process employed by Malpighi, viz. by immersion in boiling water, the mucous layer presented the appearance of a net-work, and not of a continuous layer, which it always did when maceration was employed. Not only did all the membranes generally considered as mucous exhibit these three distinct layers, but the internal coats of arteries presented the same structure. M. Flourens exhibited specimens of the mucous membranes thus prepared to the Academy.

On the Structure of the white and gray matters of the Brain, Cerebellum, and Spinal Marrow. By Dr Bergmann. (*Archives Generales de Medecine*, August 1841.)—It results from the investigations of Dr Bergmann, who consolidated the matter of the brain and spinal marrow by means of alcohol before submitting them to examination, that both are composed of numerous lamellæ, closely applied to one another, forming different circumvolutions, yet never confounding with each other. These lamellæ appeared to be formed of the white medullary substance, their outer extremities being enveloped by the gray matter. Dr Bergmann concludes from this structure that the brain is an electric centre, communicating by means of the nerves with all parts of the body. Nervous influence he therefore regards as analogous, if not identical with electricity.

As connected with the above, it may be interesting to mention that Professor Bischoff of Heidelberg (Muller's Archives, 1841, p. 20,) had made numerous experiments on the nerves, from which it appears that the most delicate instruments cannot detect electrical currents in nerves; and that they are very bad conductors of electricity, but that they have a very great sensibility for that agent; a circumstance which, according to Muller, renders them the best possible electrometers.

Observations on the Blood-discs and their contents. By John Quekett, Esq. (*Microscopic Journal,* No. 5.)—On examining the blood-discs floating in a solution of salt and water, Mr Quekett observed them to assume a corrugated or mulberry-looking appearance. When the solution of the strength of five grains of common salt to the ounce of water was added to recent blood, the discs first became stellated; little points then appeared on their edges, and afterwards on their flattened surfaces, and after a little while the points became rounded. On continuing to observe the blood-discs he observed one or two little rounded bodies escape suddenly from the interior of the disc; and, after having frequently observed this process, arrived at the conclusion that six or seven were usually contained in each blood corpuscle. He found that those discs which gave off these little granules from their interior gradually became more and more transparent, till they disappeared from the field of view, which he attributed to the solvent power of the saline infusion.

From his microscopic researches, Mr Quekett concludes that each red particle of human blood is a flattened circular disc, consisting of an outer membrane or envelope, with a thick gelatiniform fluid in its interior, which, under certain circumstances, is capable of becoming granular, and of escaping from the envelope in the form of small globules, the general number being six or seven for each disc. He also states that the discs present either a bi-convex or a bi-concave form, of which the latter is by far the most common, which is, in a great measure, dependent on the quantity of gelatiniform fluid in their interior. He was never able to make out the existence of a nucleus in the blood corpuscle.

On the Corpuscles of the Blood. By MARTIN BARRY, M. D. (*Proceedings of the Royal Society of London*, 1840–41, Nos. 46, 47.)—Dr Barry shows that the blood corpuscles are composed of a central nucleus and a surrounding red-coloured envelope, each of which present peculiar structures. The nucleus he represents as composed of two, three, or even many parts, these parts having a constant and determinate form. In the red matter which surrounds the nucleus he has detected what he calls cell-like objects, and he has noticed the existence of an orifice, at certain periods, in the delicate membrane by which this substance is surrounded. In a former memoir he stated that the nucleus of cells, instead of being absorbed, as some supposed, appeared to be the centre for the origin, not only of the transitory contents of its own cell, but also of the two or three principal and last formed cells destined to succeed the original one. (This doctrine was, however, promulgated by Valentine some years ago in his sixth section of Development of the Tissues.) Dr Barry regarded the separation of the nucleus into two or three parts as a natural process, common, probably, to all nuclei, and not produced by the acetic acid used for the purpose of showing it. He also endeavoured to prove that the nucleolus is not a distinct body existing before the nucleus, but merely one of a series of appearances arising in succession, the one within the other, and continuing to arise even after the formation of the cell. This circumstance was also previously shown by Valentine. Dr Barry applies the same remarks to the blood corpuscle, endeavouring to show that it is formed in the same way. From his investigations he asserts that the corpuscles of the blood are generated by a process essentially the same as that giving origin to those cells which are the immediate successors of the germinal vesicle, and that it is by a continuation of the same process that the corpuscle of the blood divides itself into the minuter objects figured in his former paper on the blood, viz. six rounded or oblong particles.

In his last paper on this subject, Dr Barry states that he has found every structure he has examined to arise out of corpuscles having the same appearance as those of the blood. The following are the tissues which he has submitted to actual observation, and which have given the above result, viz. the cellular, the nervous, and the muscular, cartilage, the coats of blood-vessels, several membranes, the tables and cells of the epithelium, the *pigmentum nigrum*, the ciliary processes, the crystalline lens itself, and even the spermatozoon and the ovum.

Dr Barry then traces the nucleus of the blood corpuscle into the pus globule, showing it presents a definite figure at every stage of the transition. The formation of the pus globule out of the nucleus of the blood corpuscle, he says, is essentially the same process as that by which the germinal spot comes to fill the germinal vesicle of the ovum. He then goes on to state that this same process of evolution is applicable to all the structures of the body, and nowhere more obvious than in the tables of the epithelium. The epithelium cylinders, he thinks, are formed, not by the coalescence of two objects previously single, but by division of a previously single object. Certain objects which he terms primitive discs appear to exhibit an inherent contractile power, both when single and when constituting parts of a larger object. The incipient epithelium cylinder has been observed by him to revolve by this means.

He has also seen molecular motions within the corpuscle of the blood; and he has seen young corpuscles exhibiting motions similar to the molecular, and moving through a considerable space. He also states, that he has met with the neuclei of blood corpuscles endowed with cilia, revolving and performing locomotion. He says the young blood corpuscle is a mere disc, but the older corpuscle a cell.

Dr Barry formerly described the Graafian vesicle as formed by the addition of a covering to the previously existing ovisac; this covering he afterwards stated became the *corpus luteum*. These observations he now confirms, with the addition that it is the blood corpuscles entering into the formation of the covering of the ovisac, which give origin to the *corpus luteum*. The spermatozoon he describes as being composed of a few coalesced discs. The fibres of the crystalline lens, he states, are not elongated cells, as supposed by Schwann, but coalesced cells, at first arranged in the same manner as beads in a necklace. This last remark was made by Valentine several years ago, who, in describing the same structure, makes use of the very same comparison.

Dr Barry from his researches draws the following conclusions :—1. The nucleus of the blood corpuscle admits of being traced into the pus globule. 2. The various structures of the body arise out of corpuscles having the same appearance, form, and size as corpuscles of the blood. 3. The corpuscles having this appearance, and giving origin to structures, are propagated by division of their nuclei. 4 The corpuscles of the blood are propagated by division of their nuclei. The minuteness of the young blood corpuscles is sometimes extreme; and they are to be found in parts usually considered as not being permeable by red blood.

CHEMISTRY.

Analysis of Cerebral Matter. By M. Edmond Fremy. (*Journal de Pharmacie*, August 1841.)—Of the late analyses of the brain none seems to have been conducted on more enlightened principles than that of M. Fremy. M. Couerbe in his late analysis, considered it as being composed of a great number of substances whose properties he described, and to which he gave separate names, regarding them as substances not before noticed. Most, however, of these substances seemed to be but the original organic materials of the brain, altered more or less by the chemical processes to which they had been subjected. M. Fremy used the precaution to separate each of the different animal matters of which the brain might be composed, by means of alcohol and ether, before subjecting them separately to analysis, and consequently arrived at very opposite conclusions. He found its composition to be comparatively simple, being formed of an albuminous matter, peculiar fatty matters, and water. M. Fremy first boiled the brain cut in fine slices in alcohol, then pounded it in a mortar, and agitated it with ether, and also boiled it in that fluid. The substances extracted in this manner he described to consist of a white matter, which he terms cerebric acid, cholesterine, steophosphoric acid, and traces of oleine, stearine, and fatty acids. Simple as these results are to those of M. Couerbe, it is not improbable that even some of the substances are products, not educts. This may be the case with the white matter, or the cerebric acid and the steophosphoric acid, as in the process employed to procure them, the alcohol was not expelled from the mass of the brain before the ether was added to it.

On Chondrine. By M. Vogel. (*Journal de Pharmacie*, August 1841.)—On a minute analysis of chondrine, regarded by Muller and others as distinct from gelatine, M. Vogel found it to present in every respect the very same reactions, and the only difference he was enabled to detect was, that common gelatine contained a very trifling greater proportion of inorganic salts, viz. of phosphate of lime. He found its elementary composition to be C. 48.96, H. 6.53, O. 29.63, N. 14.55, which he states he has found to be also that of gelatine.

New mode of testing the presence of Copper in Solutions. By M. Verguin. (*Journal de Pharmacie*, June 1841.)—M. Verguin has ascertained that the process which is the most delicate, and at the same time least liable to fallacy, for the detection of a salt of copper in solution, is to put a drop of the suspected solution on a plate of platina, and touch it with a piece of iron, when the electro-chemical action excited by the contact produces deposition of the fine copper on the platina plate.

PATHOLOGY.

Researches on the Movement and Sounds of the Heart. By J. H. S. Beau. (*Archives Generales de Medecine*, August 1841.)—M. Beau, who has already published several important papers on the movements and sounds of the heart, has at last arrived at very interesting conclusions. It results from his experiments and observations, that the natural sounds of the heart are accompanied each by its own peculiar impulse or motion, the sharp or first sound being attended with the striking of the point of the ventricles against the side of the chest; the prolonged or grave sound being accompanied by a movement referable to the base of the heart. He shows that the intensity of each of these movements is proportioned to that of its attendant sound; the impulse of the ventricle and its attending sound being greater than those of the base of the heart. The first sound of the heart, therefore, appears to result from the impulse of the current of blood against the ventricular walls, and the second from the striking of the current of blood against the walls of the auricle. The alternate shock of these two currents is made evident to the senses by the shock which the fingers perceive when applied to the region of the heart, and by the sound which the ear detects.

M. Beau attributes the sharpness of the first sound to the velocity with which the current of blood is darted from the auricle to the ventricle; and the prolonged nature of the second sound to the comparative slowness with which the veins impel their current of blood. In order to show that the causes he assigns for the sounds are sufficient to produce them, he instances the following experiments:—A piece of intestine, about a foot long, was tied at one end, and filled three-fourths with water; the air was then carefully expelled from the upper extremity, and a ligature passed around it also. It was essential to the experiment that every particle of air should be excluded from the intestine. The fingers were then passed around the lower end of the empty portion of the intestine, so as to prevent any water reaching that portion; and whilst strong pressure was exercised over the portion which was filled with water, the fingers were suddenly relaxed, and the water allowed to enter with a jerk into the empty space. Instantly, a sharp sound and movement were heard and seen, the sound of the shock being heard even at some distance.

M. Beau then shows how all the recorded facts can be explained on this supposition much more satisfactorily than any yet attempted. He notices the experiments of Laennec, Bouillaud, Barth, Roger, Williams, Hope, &c. and points out that many of the facts stated by them corroborate his opinion, though their theories for the sounds were so different.

He notices some of the accessory sounds as the *tintement metallique* and the *bruit musculaire;* the first being caused, as Bouillaud showed, by the impulse of the apex of the heart against the thoracic parietes, the second perhaps never being heard except in the large hearts of the lower animals when removed from the chest.

The morbid sounds, as the rasping, sawing, or blowing sounds, &c. he regards as produced by the friction of the current of blood being increased by a want of proportion between it and the cardiac apertures, this want of proportion being caused either by the increased size of the current, or the contraction of the cardiac apertures. M. Beau quotes the opinions of different authors to show that, though their theories are different, they by their statement of facts show that auriculo-ventricular disease was present when abnormal sounds had been heard during the first sharp sound of the heart; and that when this disease was present, frequently no sounds were heard attending the second sound of the heart. M. Beau also shows that, in disease of the aortic valves, the bruit caused thereby is generally heard attending the last or prolonged sound, and when it is loud masking that sound completely. He shows that these valves will be called into action just at the time when the prolonged sound is produced by the flow of blood into the auricle, and the two sounds will therefore be heard at the same time.

Case of Compression of the Heart. By Mr Adams. (*Dublin Journal of Medical Science*, May 1841.)—Mr Adams related the following very interesting case to the Pathological Society of Dublin. A man, twenty-six years of age, was admitted to the Whitworth Hospital, on account of a severe attack of chronic bronchitis accompanied by empyema. The disease did not yield to any treatment; and in a few days, through having caught a fresh cold, he was attacked with severe dyspnœa accompanied with lividity of the face, swelling of the jugular veins, and inability to expectorate. About the same period erysipelas of the right arm came on, which degenerated into a large gangrenous spot. On the 19th day of his admission the dyspnœa had increased to a frightful extent; he was sitting up in bed gasping for breath, his eyeballs protruded, his face livid and bathed in a cold perspiration, a reddish serum flowing from his mouth, his respiration inaudible, and his belly tympanitic. He remained in this state for about eighteen hours, when death put an end to his sufferings.

Both pleuræ, but especially the left, were filled with bloody-coloured serous fluid. The left lung was adherent to the posterior part of the pleura, was compressed and solidified. The heart presented the most interesting appearance. The whole organ was compressed and flattened, and it lay in a strictly horizontal direction. The right ventricle was folded on itself so as to exhibit the appearance of three rounded folds, and the parts which lay close to each other in the line of the folds were firm and of a parboiled aspect, apparently showing that the folds were of some standing. This ventricle, as well as the pulmonary artery, was quite empty. Mr Adams was inclined to believe that, for some time before death, the right ventricle and the pulmonary artery had ceased to perform any function.

On the Influence of the Inundation at Lyons on the Health of the Population. (*Journal de Medecine de Lyon*, August 1841.)—In the autumn of 1840, in consequence of the great falls of rain, and the consequent rise of the river, the town of Lyons, and the adjoining country for a radius of some miles, were laid under water. When the water at length retreated, the whole surface was left covered with slimy matter; the pools, walls of the houses, &c. became covered with greenish slimy matter, and the air, besides being loaded with humidity, was filled with a nauseous miasm. Diarrhœa, dysentery, and typhoid fevers became numerous a few days after the inundation, and, though they did not prove more fatal than usual, their character appeared changed, depletive measures were found to be inadmissible, the tonic treatment alone succeeded. Rheumatism, soon after this, began to be very common amongst the inhabitants, only acute, however, in those who had been working amongst the water. Catarrh and fever, with catarrhal symptoms, at the same time prevailed to a considerable extent. A disease of a peculiar nature, too, but having all the characters of an epidemic, attacked the garrison.

The mortality for the two months following the inundation was greatly increased. For the months of November and December 1838, it was only 750; during the same months in 1839, it was 787; but for the same months in 1840, the year of the inundation, it was no less than 1118.

On the Formation by Contagion of Confervæ on the bodies of living Frogs, and on the Influence of the nerves on the movement of the blood in the Capillary vessels. By M. Stilling of Cassel. (*Muller's Archives*, 1841, p. 279.)—M. Stilling found that the entire or partial extirpation of the spinal marrow produced in frogs a stoppage of the circulation of the blood in the capillary vessels of the lower extremities; a phenomenon which never took place when the spinal marrow was simply divided. On frogs thus deprived of their spinal marrow, and after which they live for several months, there became developed on the toes of the hinder extremity, grayish spots, which presented the appearance of disorganized epidermis. These spots were easily removed, but were reproduced with great facility. If not removed, very fine filaments resembling mould sprouted up with such rapidity, that in two days an efflorescence several lines in length covered the affected parts. This efflorescence, when examined by the microscope, was found to be composed of long tubes, frequently dichotomous, and filled more or less completely with black granules, which Dr Stilling satisfied himself were ova. This disease was capable of being propagated by inoculation to salamanders, lizards, and unhealthy frogs; but frogs in health did not seem to be affected by it. Dr Stilling, after ascertaining that the contents of these tubes were precisely similar to the matter produced by the decomposition of dead frogs, and that they actually consisted of the ova of infusoria (for he observed living animals originate from their ova) considered, contrary to M. Hannover's opinion, that the notion of its vegetable nature was untenable.

Similar productions have been seen by various observers on sickly, dying, or dead animal bodies. In the seventh volume of the Edinburgh Journal of Science, notice is taken of Dr Watson's account of the vegetable fly of Dominica, specimens of which sent to Dr Hill turned out to be a species of Clavaria, similar to what is found on dead animal matters, growing from the body of the insect. Dr Mitchell of New York's observations on the vegetating wasps, &c. are also noticed, and shown to be owing to the growth of a vegetable production on the bodies of these animals, as well as on the bodies of caterpillars, moths, &c. They were only seen on the dead bodies of these animals, and on the parts where moisture might be supposed to lodge.

Numerous observations have since that time been made regarding similar productions. In the Edin. New Phil. Journ. for October 1830, Dr Stark noticed the growth of a conferva-looking substance on the caudal extremity of fishes as their probable natural death. Ehrenberg has also remarked a similar occurrence with regard to fishes. M. Hannover in addition noticed them on the bodies of living Tritons, and Schonlein, Gruby, and others, have described a similar production as being found on the diseased surface of persons affected with tinea.

M. J. Virey, in an interesting paper in the Journal de Pharmacie for November 1841, has collected together a number of these scattered observations, showing that the so-called muscardine of the silk worms, the mycoderma of the crust of tinea, and of other cutaneous diseases, were true reproductive sporules, vegetating whenever they met with a favourable soil. He thought it probable that the furfuraceous crusts on the head of unclean children, and numerous forms of skin disease, belonged really to the class of vegetables called mould or mycoderma. M. Meynier has lately asserted that warts are true gymnosporanges, and pulmonary and intestinal tubercles of phthisis and scrofula have been referred by the same individual to the genus Lycoperdon. Cancer has been also regarded as a species of uredo, somewhat similar to that production which destroys the grains of wheat. M. Virey, however, thinks these last results as premature. He states, however, on his own knowledge, that vegetable productions appear on ulcers, precisely similar to those which appear on dead animal matters, mushrooms, the chrysalides of lepidopterous insects, the wasps of Guadaloupe, &c. He also states that Rousseau, Serrurier, Deslongchamps, &c. have recognized the same vegetations in the windpipe and bronchii of fowls, pigeons, turkeys, geese, &c. and in the bodies of the *Cervus axis* and the *Testudo indica*. From these observations he concludes with apparent justice, that the same or analogous productions will be found whenever animal matters are found in a state proper for their germination, whether it be on the dead body or the diseased secretion of the living.

On Thirst as the cause of Hydrophobia. By Thomas Stratton, M.D. Edinburgh. (*In a letter to the Editor Edin. Med. and Surg. Journ. dated, Kingston, Canada, October* 1841.)—From what is observed in Canada, it would seem that canine hydrophobia is occasioned by thirst. It very rarely occurs in summer. I have not heard of a case these three last summers, while every winter several are heard of in every neighbourhood. In December 1839, a fox, in a state of hydrophobia, was seen on the ice in the Bay of Quinte near Kingston; it bit two pigs, one of which, three weeks, and the other, two months after, became hydrophobic and died. The fox, lying down exhausted, a man went up to it and killed it with an axe. In January 1841, a fox, a few miles from this place, came near a farm-house and bit three pigs, which died two months after. On the 6th of March 1841, the magistrates of Kingston published handbills to the effect, that several mad dogs having been seen in the town, all dogs seen loose would be shot. That thirst is the cause of hydrophobia has been often asserted before and also denied. However, it would appear that in this country the fox, in the severely cold winter, when all the pools are frozen over, becomes rabid, and then coming near farm-houses and villages, bites dogs and other animals that come in its way. It is generally thought here that the dogs that go mad have been bitten by foxes. It is difficult to conceive a domestic dog not having access to water, except when it is chained up and neglected, and this, of course, may be either in summer or winter. Though dogs do lap up the snow a little, the action is probably too unpleasant to allow an animal to take enough of it. If heat was the occasion of hydrophobia in dogs, there would probably be more of it in summer in Canada, where the thermometer sometimes stands at eighty-six degrees of Fahrenheit, and cold seems to have no effect, except the indirect one of placing an icy barrier betwixt the wild fox and his only drink.

MATERIA MEDICA AND DIETETICS.

Report of the French Academy on the Nutritive Properties of Gelatine. (*Comptes Rendus des Seances de l'Academie des Sciences,* Aug. 1841.)—The Committee, consisting of MM. Thenard, D'Arcet, Dumas, Flourens, Serres, Breschet, and Magendie, fed a number of dogs with gelatine, in its various states, and as obtained from various substances. They found that these animals, in general, obstinately refused to take it above once or twice, and died as speedily as if they had been completely deprived of food. Even when the gelatine was flavoured, by being boiled with a little fresh meat, though the dogs partook of it more readily at first, all died in the time they would have done, had they been deprived altogether of nourishment. When fed on on a mixed diet, the dogs were perfectly nourished, and even when fed for months on raw bones, maintained their health and vigour unimpaired. Bones which had been boiled had not, however, the same nourishing qualities; the animals rapidly fell off when kept on that diet. The conclusions at which the Committee arrived were the following:—

1. No known process can extract from bones an aliment which can supply the place of fresh meat.

2. Gelatine, albumen, or fibrine, taken separately, only nourish an animal for a very limited period, and in a very imperfect manner. In general, these substances excite in a short time an insurmountable disgust, so that the animals will rather die of hunger than eat them.

3. These same principles, artificially united, and rendered savoury by proper seasoning, are taken more freely and for a longer time, than when separate, but in the long run, they nourish the body no better; for the animals which eat them, even in considerable quantities, end by dying with all the signs of complete starvation.

4. Muscular flesh, in which gelatine, albumen, and fibrine are united according to the laws of nature, and are associated with other matters, as fat, salts, &c. suffice, even in small quantity, for complete and prolonged nutrition.

5. Raw bones have the same property, but the quantity consumed in twenty-four hours requires to be considerably greater than if fresh meat were given.

6. All kind of preparation, as decoction in water, the action of hydrochloric acid, and, above all, its transformation into gelatine, diminishes the nutritive quality of bones, and seems even in certain cases to deprive them of it altogether.

7. The Committee do not take on them at present to decide as to the question of the nutritive powers of gelatine for human food when given alongst with other alimentary matters; they are aware that direct experiments on a large scale can only decide the question. They are engaged in this investigation at present, and will make known the results soon.

8. Gluten, as procured from the flour of wheat or of maize, suffices of itself for a complete and prolonged nutrition.

9. Fat substances, taken as the only aliment, support life for a long time, but they give rise to an imperfect and disordered nutrition, where the fat accumulates in all the tissues, sometimes in the state of oleine and of stearine, sometimes in the state of almost pure stearine.

On the employment of the Gelatine and Fat of Bones as a means of ameliorating the Diet of the Poor. By M. D'Arcet. (*Annales D'Hygiene Publique.* April 1841.)—M. D'Arcet, from the examination of the annual reports of various hospitals, gives an apparently satisfactory answer to the seventh conclusion of the French Academy as to the nutritive power of gelatine. He shows, that the directors of the different hospitals at Lille, Metz, Lyons, Strasbourg, different parts of Russia, and the whole of Holland, have found experimentally, that the health of their inmates has improved from the date of their fitting up an apparatus for extracting the gelatine and fat from bones. With regard to one of the hospitals at Lyons, he mentions the very striking fact, that the mortality appeared to be reduced by this means alone from 90 to 72, at which it has averaged ever since the apparatus for the preparation of the gelatine soup was fitted up. Many other interesting facts are mentioned, showing the advantage of hospitals being provided with an apparatus for the preparation of gelatine from bones, for it appears that, whenever this gelatinous soup has been added to the diet of the patient, the sickness, and consequent expense for medicines has been greatly lessened, the mortality has been considerably diminished, and the general health of the inmates greatly improved.

On the Baneful Effects which occasionally result from the Seeds of the Lathyrus Cicera, when used as food by Man or Animals. By **M. A. Chevallier.** (*Annales d'Hygiene Publique,* July 1841.)—In his very interesting memoir, M. Chevallier relates numerous cases where paralysis of the lower extremities, a peculiar affection of the larynx giving rise to asthmatic symptoms, and even death itself, resulted from the use of the chick pea as an article of food. M. Desparanches relates that, in the arrondissement of Blois and Vendome, during the spring of 1829, the poor were obliged to mix the flour of the chick pea with that of wheat, on account of the scarcity and high price of the latter article. The bread prepared half of chick pea and half of wheat had a black colour, a bitter taste, and a smell of mouldy bread. All who used this bread for any length of time became affected with convulsive tremors of the muscles of the inferior extremities, with great weakness, and at last a kind of incomplete paralysis. The heat of the body was, at the same time, increased, violent thirst was much complained of, and many were affected with somnolency. The animals fed on the chick pea, as horses, sheep, and pigs, got fat on it, and their coats presented the sleek appearance of health, but their strength fell off, they walked with trembling unsteady steps, and seemed to be affected with the very same symptoms as occurred in the human species.

Several instances are quoted from the reports of different individuals of the deleterious effects of chick pea as food for horses. In them it appears chiefly to have produced a kind of asthmatic affection, which, however, did not appear till the animal was put in violent motion, when it often tumbled down, being affected, at the same time, with a spasmodic affection resembling tetanus. Six cases of death are related as occurring in horses from this affection.

At the same time that M. Chevallier relates these baneful effects from the employment of the chick pea as an article of food, he quotes the report of M. Sicardet, an agriculturist at Tarsul, who, since 1832, has largely raised this pea, and employed it as the principal food of his live-stock, cows, sheep, horses, and pigs. He strongly recommends its more extensive culture as a safe, nutritive, and economical food for these animals; and relates that all his stock throve better on it than any other article of nourishment, the cows, at the same time, giving both a greater quantity of milk, and of a richer quality.

On the Ferruginous Bread of M. Derouet-Boissière. By the Commission of the French Academy. (*Bulletin de l'Académie Royale de Medecine,* April 1841.) M. Derouet-Boissière having been extremely successful in curing obstinate cases of amenorrhœa and chlorosis, which had resisted all other means of treatment, by means of bread impregnated with minute doses of iron, a committee of the Academy of Medicine was appointed to report on the subject. They accordingly saw bread prepared with small quantities of lactate, acetate, and protocarbonate of iron, and proceeded in the public hospitals to make trial of its powers. The bread was prepared in the proportion of 3½ ounces of bread to 3 or 4 grains of the salts of iron, and it is stated that when the iron did not exceed this quantity, the bread had no disagreeable flavour, though the chalybeate taste was slightly apparent.

During the months of November and December 1840, seven chlorotic patients were treated with this bread in the Hotel Dieu. They were allowed two small loaves of this bread daily, each containing about 3 grains of the lactate of iron, and occasionally an equal quantity of sub-carbonate. Of the seven chlorotic females, five had the disease in a very advanced stage, the other two were in a state of anæmia, brought on by repeated and copious evacuations of blood. These last two were not able to take the quantity of bread allowed them at first, but gradually became able to do so, and left the hospital cured, the one after six weeks of treatment, the other after two months. Their menstrual discharges were by that time completely re-established.

Two of the confirmed cases of chlorosis were sensibly improved after the use of the bread for six days, and one was dismissed cured in a fortnight, the other in a month.

The other three cases were old confirmed cases, which had resisted the usual treatment employed for the cure of this disease, and their cases are given in detail. In the first of these cases the treatment by the ferruginous bread was begun on the 20th of November, and by the 6th of December the menstrual secretion appeared and continued for three days. She was nevertheless kept in the hospital for another month, when having become quite regular, and all symptoms of chlorosis having disappeared, she was dismissed. In the second case the ferruginous bread was begun to be administered on the 4th of December. On the 10th, she was less pale and felt better. On the 24th the menses appeared and continued four days. She rapidly improved from this date, but was detained in the hospital till the next menstrual period was over, when she was dismissed cured. The third case was the most severe, and the symptoms of chlorosis of longest duration; the health seemed completely broken. The treatment commenced on the 20th of December, and she was allowed two of the small loaves daily. For the first fifteen days there was little apparent improvement, but from this date the symptoms of amendment became obvious. Her pallid cheeks gradually acquired a little colour, she improved in health and strength, and was dismissed with all the marks of health on the 22d of February.

Soon after this chalybeate bread was administered, the committee were able to detect the presence of iron in the urine, but its appearance there seemed to be inconstant, as they would often detect it at one time, and not at another.

The Committee from these trials concluded, that this is an excellent mode of administering chalybeates; that, when in the small proportion of two or three grains of this salt to the loaf of three ounces and a half, its presence cannot be detected by any change of colour; that the salt of iron used is not decomposed by the process of baking; and that the iron can always be detected in it by the use of the ordinary reagents.

It may be remarked, that M. Derouet-Boissière was first led to administer iron alongst with the food, from the conviction that it would be more likely to be taken into the circulation, by being absorbed alongst with the chyle, than if given according to any of the usual methods.

THERAPEUTICS.

Case in which diarrhœa from ulceration of intestinal glands disappeared under the internal use of chloride of sodium. By Mr C. J. Mill, Surgeon, Kirriemuir.—A. F., aged 29, after exposure to cold and wet, was seized with rigors followed by acute pain in head and abdomen, and violent purging. He stated that for these symptoms he had lost a few ounces of blood, and taken calomel and salts. I saw him after he had been a fortnight confined to bed, and found him then very much reduced, almost unable to sit up in bed; with the pulse at 90, full and hard; the abdomen tender on pressure or motion; purging almost incessant; matters passed sometimes bloody mucus in large quantities, at other times very dark thin feculent matter, like fluid pitch, always excessively fœtid. He complained much of tormina; also of irritation of urinary organs. He had great thirst; the tongue was glazed, red, and dry; total loathing of food. He complained still of pain in head; and last night he was a little incoherent.

I opened a vein and bled him to approaching syncope; gave calomel, castor oil, and opium; had the head shaved, and cold lotions applied; blister-ed the abdomen, and then applied hot poultices. Arrow-root gruel was prescribed for food.

After bleeding, &c. the pain in abdomen was much relieved, but the purging continued unabated. The matters discharged were still as dark coloured (not such a colour as arises from the use of mercurials), and fœtid as ever. The tongue and teeth were covered with black sordes; the pulse was quick, small, and weak; the patient had low muttering delirium; but the pain in the abdomen was gone. As the purging was giving so very great uneasiness to the patient, whom I considered sinking from sphacelus, the result of neglected inflammation of the mucous membrane of the bowels during typhoid fever, I ordered chalk mixture to be given every three hours until it should abate; and gave wine and nutritious soups. These measures were followed by relief at the time; but whenever the chalk mixture was intermitted, the tormina and purging recurred as before.

The fœtor from the evacuations and breath was now so excessive that I gave some solution of chloride of sodium to sprinkle in and about the patient's bed to quench the smell. It occurred to me, that, if given internally, it might act in a similar way by correcting fœtor, and inducing healthy action. I therefore ordered a drachm of it to be given in half an ounce of chalk mixture, and repeated every four hours. Next day when I visited my patient, I was quite delighted and surprised to find his appearance so much changed for the better. He had had a refreshing night's sleep; the purging was abated; the tormina ceased; there was no fœtor; and the black crust was separating at the edge of the tongue. The countenance was expressive of hope. He had taken a little arrow-root in the morning. I ordered the chloride to be continued, omitting the chalk mixture, and substituting wine in its place. His recovery has been rapid, and is now complete; only requiring an occasional small dose of castor oil.

Kirriemuir, 20th November 1841.

OBSTETRICS.

Contributions to Obstetric Pathology. By Dr Gilman of New York. (*American Journal of the Medical Sciences*, July 1841.)—The most important of Dr Gilman's contributions refer to the structure of the uterus at the spot where the placenta had been attached. The place of attachment was indicated by many large openings in the internal lining membrane, evidently the orifices of the uterine sinuses, and for the most part plugged up with pretty firm coagula. When the coagula were removed and the orifices carefully examined, they were found to be generally elliptical or semicircular in shape, and so arranged as to form a single or double valve. To comprehend this fully, it is necessary to bear in mind that the inner layer of uterine structure, where the placenta is attached, is traversed by so many and large veins and curling arteries, that its texture is cribriform, and in many places the vessels are separated from each other by a septum of uterine structure of extreme tenuity. When the large sinuses are about to terminate on the inner surface of the uterus, the orifice is diminished, sometimes from one side, sometimes from both, by a flap or valve of thin fibres, which projects over it, leaving in the one case a semicircular, and in the other an elliptical opening, always much smaller than the sinus just within. These thin flaps can be lifted up with the probe, and thus, without tearing anything, the orifice may be doubled in size. It seemed that these openings were for the most part closed, not by superimposed decidua, but by a valvular flap of true uterine structure. When the margins of these orifices were examined by means of a powerful microscope, the margin was found perfectly smooth, clean, regular in its minute structure, and in all cases well defined. The inner lining membrane of the sinus from the margin of the orifice to the depth of a line and more, was found smooth and regular, and terminated at the verge of the opening in a clean edge, free from shreds or any other evidences of laceration.

Case of Amputation of the Limbs of the Fœtus in Utero. By Dr Nixon. (*Dublin Journal of Medical Science,* May 1841.)—Dr Nixon exhibited to the Pathological Society a preparation illustrative of one of the modes in which spontaneous amputation of the limbs of the fœtus *in utero* take place. Dr Montgomery and others have shown that this is usually the result of bands of plastic lymph encircling and compressing the limbs at certain points. In Dr Nixon's case the same effect had been produced by the umbilical cord. The woman had aborted at the third month, and on examining the fœtus it was found that the umbilical cord had formed a kind of ligature round the thigh a little above the knee. The limb was indented down to the bone, and the circulation between it and the leg was maintained only by the vessels which passed through the adductor muscles at the posterior part of the limb.

TOXICOLOGY.

Case of Poisoning by inhalation of Arseniuretted Hydrogen Gas. By Dr O'Reilly. (*Dublin Journal of Medical Sciences,* Vol. xx. p. 422.)—There occurred, in Dublin in October 1841, a case of fatal accidental poisoning, which has led to various experimental researches, the result of which, if well founded, ought to make medical jurists and toxicologists very cautious in deducing conclusions from the usual experiments on arsenical poisoning.

Mr Samuel Brittan, aged 31, a druggist and chemist of some eminence in Dublin, and greatly distinguished by the zeal and diligence with which he cultivated the practical department of chemistry, had been occupied in composing a work on chemical manipulation, containing, among other matters, experimental inquiries on the effects of inhaling some of the gases. On the 23d October 1831, when in good health, Mr Brittan inhaled at two different periods about 150 cubic inches of gas, which he believed to be hydrogen, thinking that, if pure, it would not prove hurtful, and that the only effect following it would be considerable though temporary shrillness of the voice. The experiment was made with the intention of observing and recording its effect on the economy, which he expected to be trifling and temporary.

Immediately after inhaling the last portion of gas, Mr Brittan was seized with giddiness and faintness, followed by shivering, during which one evacuation took place from the bowels, and about two ounces of blood were discharged without pain from the urethra. Soon after he felt pain in the lower extremities, especially the right, and numbness in the upper and then in the lower extremities followed by a tingling sensation. These symptoms after about two hours subsided, and then followed pain in the loins and constant vomiting, lasting from three in the afternoon till seven in the evening.

When seen at that hour by Dr O'Reilly, he complained of weakness and a bitter taste in the mouth; the pulse was 90 and feeble; the heat of the surface was diminished; dull pain at the epigastrium when pressed; and the voice whispering, the latter change having taken place while inhaling the gas. The matter vomited was greenish, about two quarts in amount. A draught of opium and ammonia in orange-flower water was directed to be taken every third hour; the feet were immersed in warm water; and an emollient enema was administered.

At 10 P. M. eight leeches were applied to the epigastrium followed by a poultice; and four minims of the black drop, with three grains of mercury and chalk were ordered to be given every second hour.

24th, next day, it was found that vomiting recurred every hour during the night, the patient having slumbered in the intervals. The matter vomitted was greenish. The bowels had been moved; but no urine had been passed. The face was of a copper colour or dark reddish-yellow, while the conjunctivæ and the surface of the body was greenish-yellow. The pulse was 80, strong. The epigastrium was tender, but not painful, and the patient had hiccough.

Ten leeches were ordered to the epigastric region, to be followed by a sinapism for twenty minutes; and the other remedies to be continued.

In the evening the vomiting of greenish fluid was less frequent. A little blood was passed from the urethra. The patient was intelligent, and made no complaint of pain. Opium stopped; a blister applied.

Next day, 25th, the vomiting was less frequent; no epigastric pain, and pulse at 76, though hiccup continued. The blister did not vesicate. No motion and no urine. A mixture of Epsom salts, an enema, and diluents were prescribed.

On the 26th, the stomach had retained medicine; the bowels had been freely moved; the yellow colour was disappearing. No urine was passed. Draughts of bicarbonate of potass and bitartrate of potass were prescribed, with iced-water, chicken broth, and wine and water.

On the 27th, the yellow colour had nearly disappeared; there was no fever or pain, and vomiting had taken place only once during the night. But the patient was very weak, and restless, and thirsty, and passed no urine; the face was œdematous, and an ammoniacal odour was exhaled by the breath. The hip-bath for twenty minutes, diluents, and draughts of nitre and sweet spirits of nitre, with a little claret, were recommended.

On the 28th, after a restless night, during which the bowels had been thrice moved, but without any secretion of urine, as ascertained by introduction of catheter; the œdema of face continued; the tongue was swelled, and on its right side was a deep irregular ulcer. The liniment of vinegar of squills and muriated tincture of iron was freely rubbed on the lumbar region, and the hip-bath was employed.

In the evening somnolency was increasing and the memory was impaired.

Next day, 29th, after some sleep and seven motions, and the discharge of a small quantity of urine depositing blood, the ammoniacal odour of the breath continuing, the tongue presented a small pointed, dark-coloured tubercle, and he complained of palpitation. At twelve noon, weakness was extreme. At four, symptoms of approaching dissolution appearing; and at seven in the evening, Mr Brittan expired, having lived six days and four hours, or 148 hours, after inhaling the supposed hydrogen gas.

The body, inspected thirty-six hours after death, disclosed the following appearances:—

Universal anasarca; integuments of the abdomen of a faint greenish colour; and the abdomen distended with air.

The *dura mater* was natural; the arachnoid membrane a little vascular, containing beneath it air-bells; the substance of the brain was bloodless; and there was no fluid in the ventricles.

The lungs were collapsed, natural in structure, but containing little air. Two pints of reddish-brown fluid with little odour was effused within the chest. The heart was pale and flabby, not changed in structure, and without blood in chamber. A little fluid was contained in the pericardium.

The liver was of a deep indigo colour, not increased in size; the gall-bladder distended with bile. The stomach was empty, but presented two reddish patches in the great curvature, and its mucous membrane was easily detached.

The kidneys were throughout of a deep indigo colour; the left was very large, resembling, in internal structure, the spleen; the right was smaller and firm. The bladder was empty and natural.

In considering the nature and termination of this case, the first point that awakened the inquiries of Dr O'Reilly was, whether the hydrogen was pure or not, and if impure what were the impurities? To determine this point, he first took some of the sulphuric acid, which had been employed by Mr Brittan, and some of the zinc, and by adding water to them, caused the evolution of hydrogen gas; from which he obtained a large portion of arsenious acid and metallic stains. This gas was introduced into a glass tube; he heated the latter to redness, and in the cool portion of it was deposited a large quantity of metallic crust of a crystalline appearance. The fluid tests were next employed with the same result; and finally the arsenious acid was mixed with charcoal, and by reduction metallic arsenic was obtained.

The second question for consideration was, in which of the two ingredients was the arsenic contained. In the course of pursuing this inquiry Dr O'Reilly found, that it was impossible to obtain from the shops pure sulphuric acid; and after subjecting six different specimens from different establishments in Dublin to experiment, he found all to contain more or less arsenic. By using iron-turnings in place of zinc, he found that arsenious acid was still formed. On the other hand, in a specimen of German sulphuric acid, obtained from Professor Kane, and which he used with the ordinary zinc of commerce, he found no arsenic. The fuming sulphuric acid of Germany which is procured by decomposing sulphate of iron is quite free from arsenic. The British sulphuric acid, on the contrary, prepared in leaden chambers from iron pyrites, was shown formerly by Dr Rees, and now by Dr O'Reilly, to contain arsenic or arsenious acid.

Thirdly, Dr O'Reilly found, that the reddish fluid contained within the pleura gave proof also that it held arsenic in solution.

From subsequent experiments on the sulphuric acid and the hydrogen, furnished by a given quantity of acid, aided by the calculation of equivalents, Dr O'Reilly concludes, that the amount of arsenious acid inhaled by Mr Brittan was about twelve grains.

The narrative of the circumstances now given suggests several interesting reflections and inferences. Since it has been the custom in this country, of late years, to employ iron pyrites in the preparation of sulphuric acid, that substance has contained an admixture of arsenic. Hence, it will not do to use such acid in the preparation of sulphuretted hydrogen, when it is prepared by means of the latter, to precipitate arsenic in suspected mixed fluids; nor will it be proper to employ iron pyrites in the preparation of sulphuret of iron for the same purpose, since the arsenic contained in this mineral may be joined with the sulphuretted hydrogen thus procured. It seems doubtful whether arsenic is contained in sulphuric acid in sufficient quantity to be a source of danger or fallacy in any other respect.

The inhalation of the same gas proved fatal to another chemist, M. Gehler, who, when engaged with Ruhland in researches on the mutual action of arsenic and potass, inhaled a small portion of arseniuretted hydrogen, and who at the end of one hour was attacked with continued vomiting, shivering, and great weakness, which increased till the ninth day, when death took place. The inhalation of arseniuretted hydrogen produces death, not perhaps so rapidly as the introduction of arsenic into the stomach or by a wound, but with equal certainty and with very similar symptoms, making allowance for the interval elapsing between inhalation and death.

On the occurrence of Arsenic in the Muriatic Acid of Commerce. By M. ALPHONSE DUPASQUIER. (*Journal de Pharmacie*, December 1841.)—In the course of some experiments on zinc, in which the apparatus of

Marsh was employed, M. Dupasquier obtained a quantity of arsenical spots when he employed muriatic acid, but none when sulphuric acid was used. On investigating the subject he ascertained that the arsenic did not come from the zinc, but from the muriatic acid employed; and, on subjecting it to various tests, he distinctly proved its adulteration with arsenious acid. Thus when a quantity of the acid was mixed with several times its volume of water, and a stream of sulphuretted hydrogen gas was passed through it, a copious yellow precipitate of the sulphuret of arsenic was precipitated. On testing the acid by the apparatus of Marsh the same result was arrived at, arsenical spots were obtained.

The purified acid prepared from this arsenious commercial muriatic acid exhibited the arsenic in nearly the same proportion, the distillation which it had undergone appearing to have no effect in diminishing the quantity of arsenious adulteration. The proportion in both kinds of acid was nearly 1 in 1000 parts, more correctly 0.722 in 1000.

On investigating the mode in which this adulterated muriatic acid was obtained, he found that it was prepared from the chloride of sodium by means of sulphuric acid which contained a quantity of arsenic; which sulphuric acid was prepared from the sulphur obtained from the copper pyrites of Saint Bel and of Chessy.

It is important to observe, that all the hitherto recorded observations seem to prove that the sulphuric acid prepared from the metallic sulphurets or the sulphur after its separation from the ore, contain a considerable proportion of arsenious acid. Every preparation, therefore, which is prepared from, or by means of, this sulphuric acid, ought to be carefully tested before being thrown into the market. The Edinburgh College of Physicians attending to this adulteration, both in the sulphur and sulphuric acid, directs that they be tested for the presence of arsenic before being used in pharmaceutical processes or administered medicinally. As the most simple and delicate test, they direct alone the test by sulphuretted hydrogen gas.

We regret to have to announce, since the appearance of our last number, the death of Dr Yelloly, formerly Physician to the London Hospital. This event took place on the 31st January, at Cavendish Hall, Suffolk, where Dr Yelloly had been residing during some time past. Dr Yelloly was a native of Northumberland, and received his literary and medical education at the University of Edinburgh. After taking his degree he commenced practice in London, and speedily became connected with the London Hospital, and was much esteemed as a physician, both in public and private. With Dr Marcet, Mr Astley Cooper, afterwards Sir Astley, and a few others, he was one of the original founders of the Medico-Chirurgical Society, continued throughout to take great interest in its proceedings and welfare, and was instrumental, with other leading members, in procuring for that body their Royal Charter. After several years practice in London, Dr Yelloly removed to the neighbourhood of Norwich, and continued to take much interest in the welfare of the hospital of that city. Subsequently he was one of the great promoters and principal supports of the British Association, and, so long as his health permitted, continued to attend its meetings very regularly.

About eighteen months ago, when resident for some time at Dawlish, Dr Yelloly had an attack of hemiplegia; and though he recovered in a great degree the use of the side, and his mind was active and vigorous, he at last gradually gave way, and died in his 65th year.

Dr Yelloly was a very active and zealous contributor to medical science in the Medico-Chirurgical Transactions and in the Philosophical Transactions. He is probably the last of that distinguished circle by whom the Medico-Chirurgical Society was founded.

Dr Yelloly possessed a highly cultivated mind, much accurate informaon, and was a person of most amiable manners.

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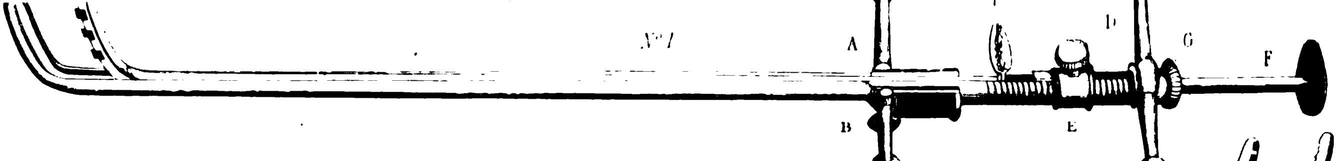

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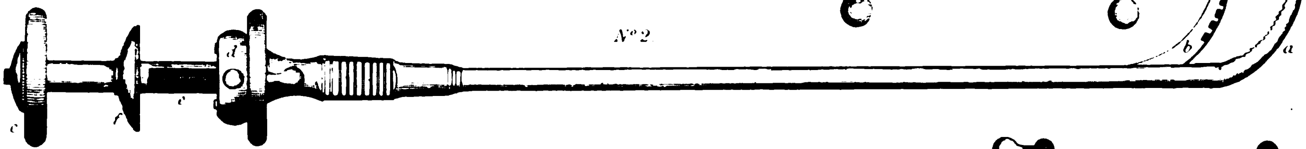

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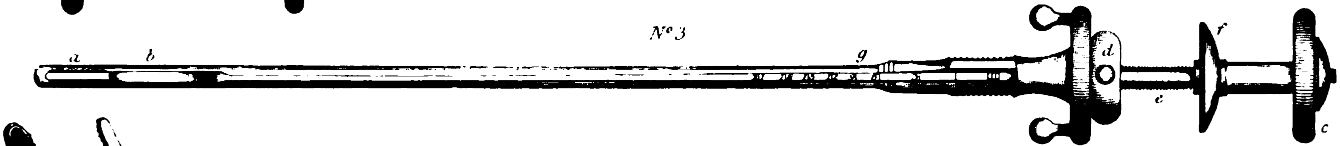

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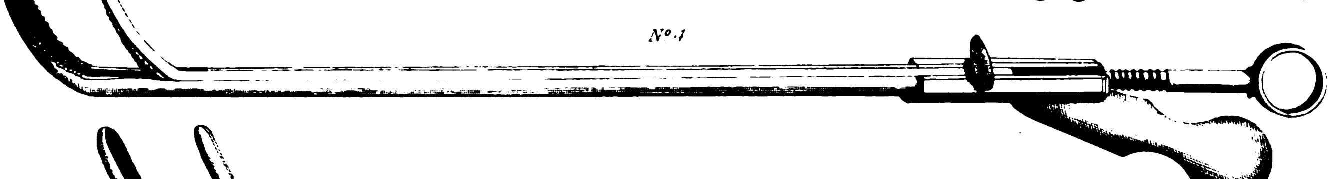

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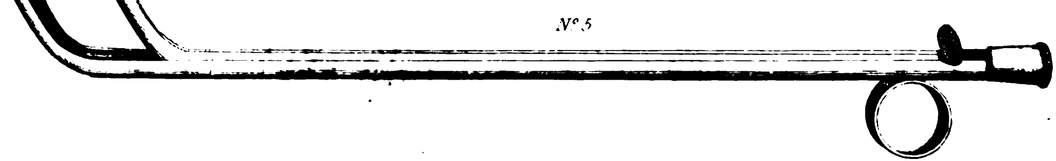

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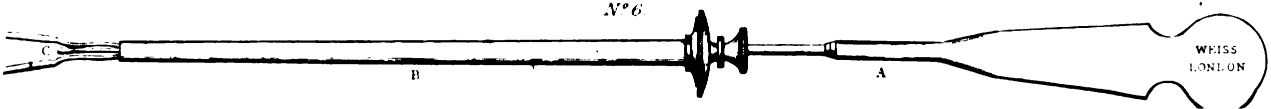

Dr FAIRBAIRN ON EXTRA UTERINE CONCEPTION.

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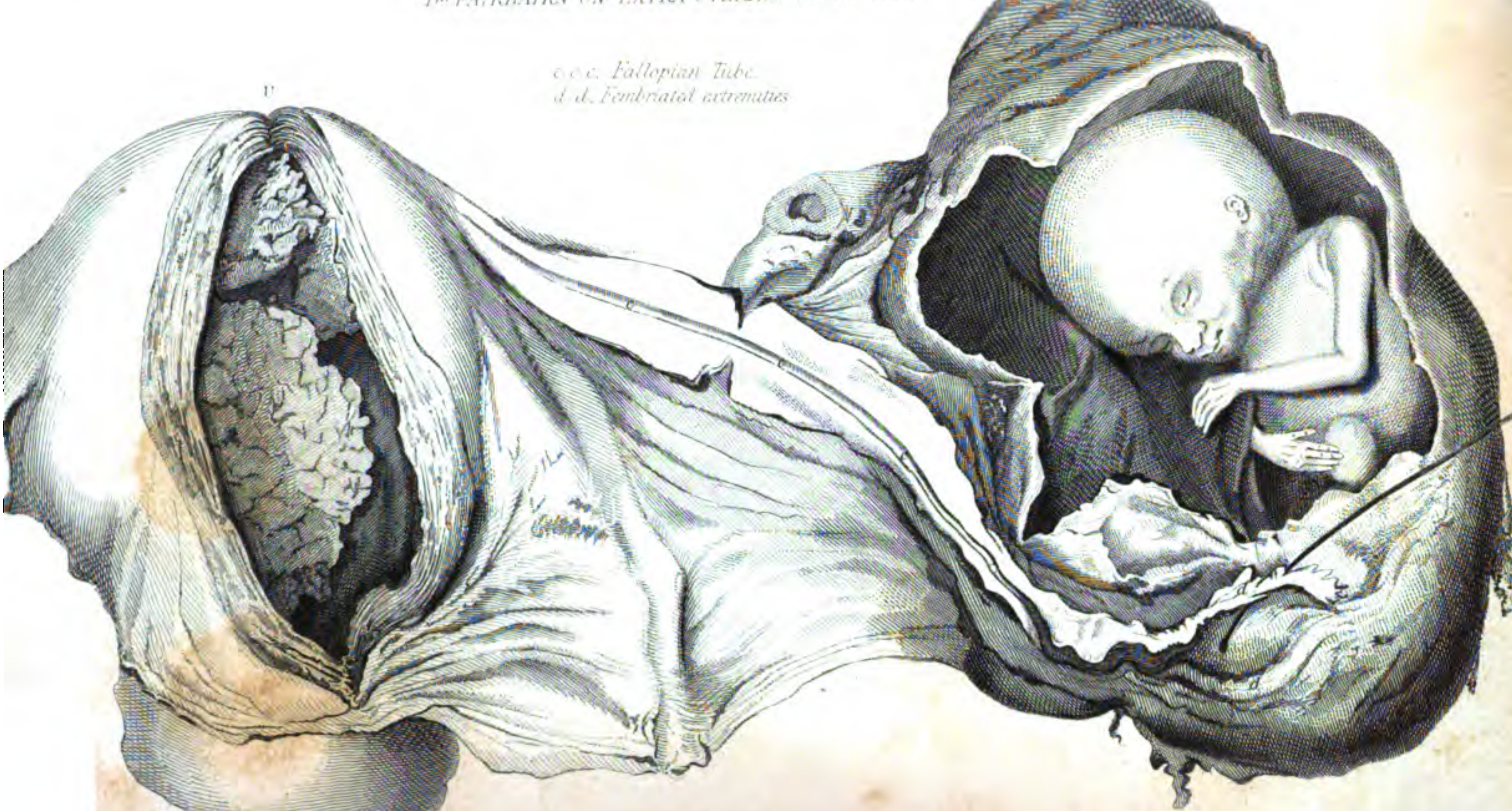

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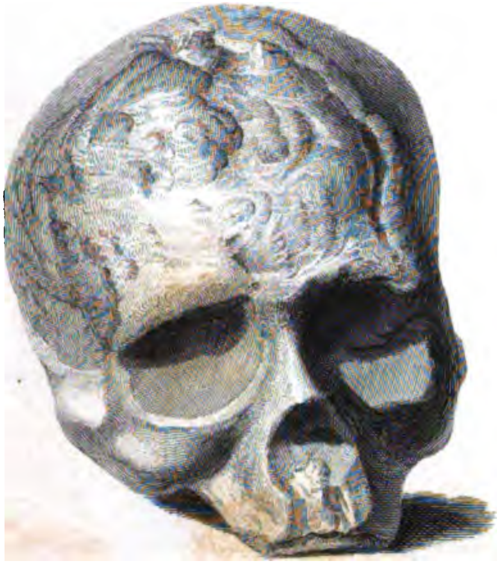

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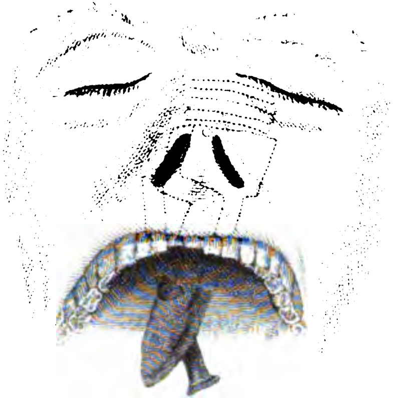

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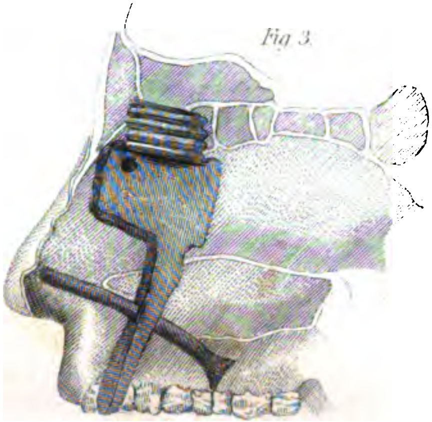

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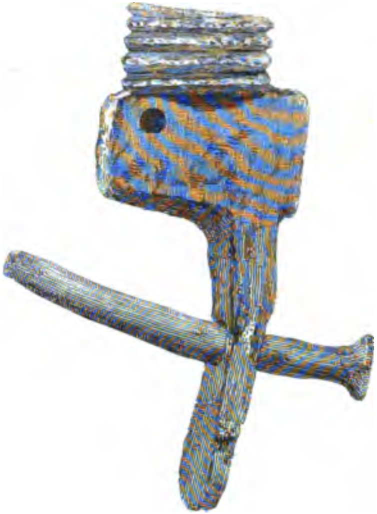

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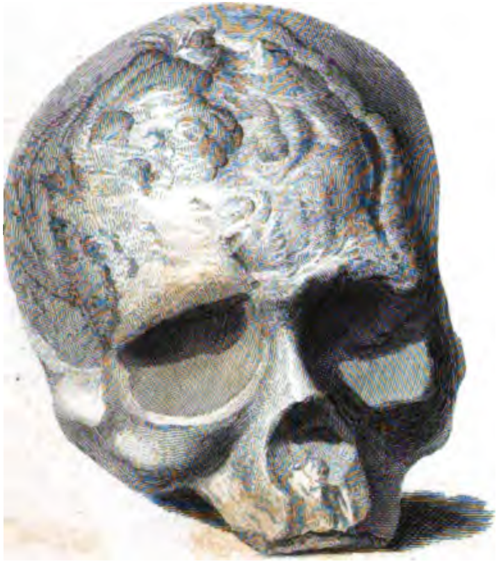

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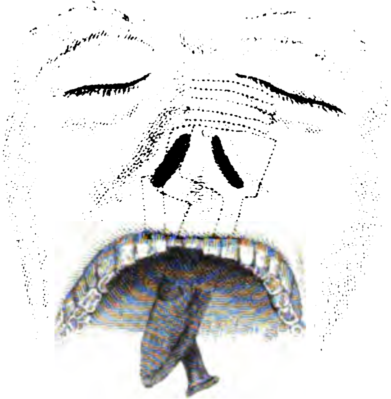

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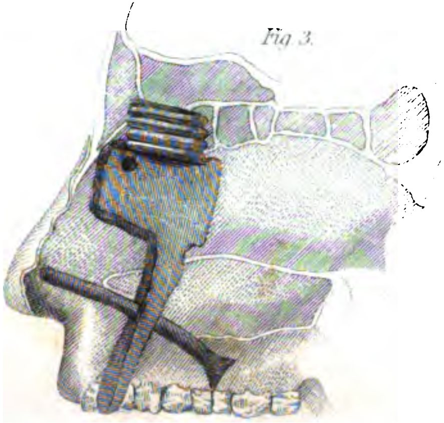

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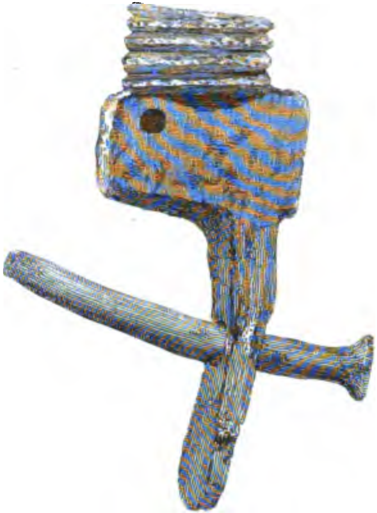

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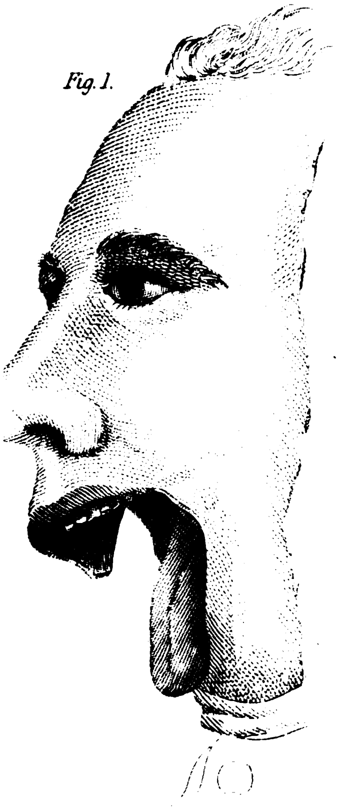

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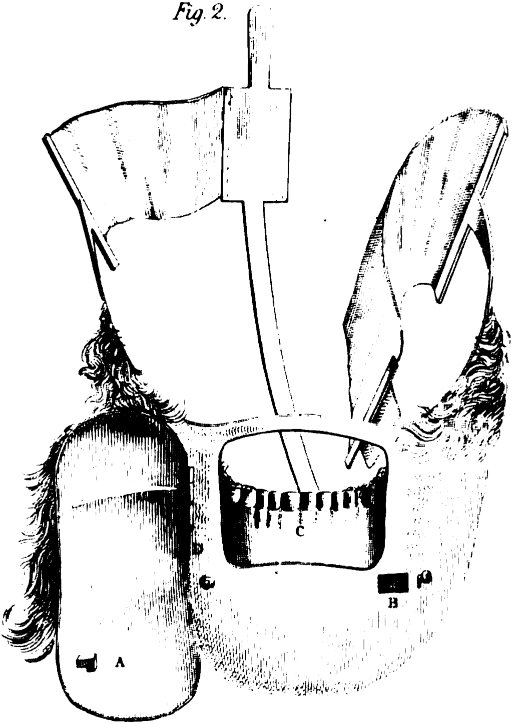

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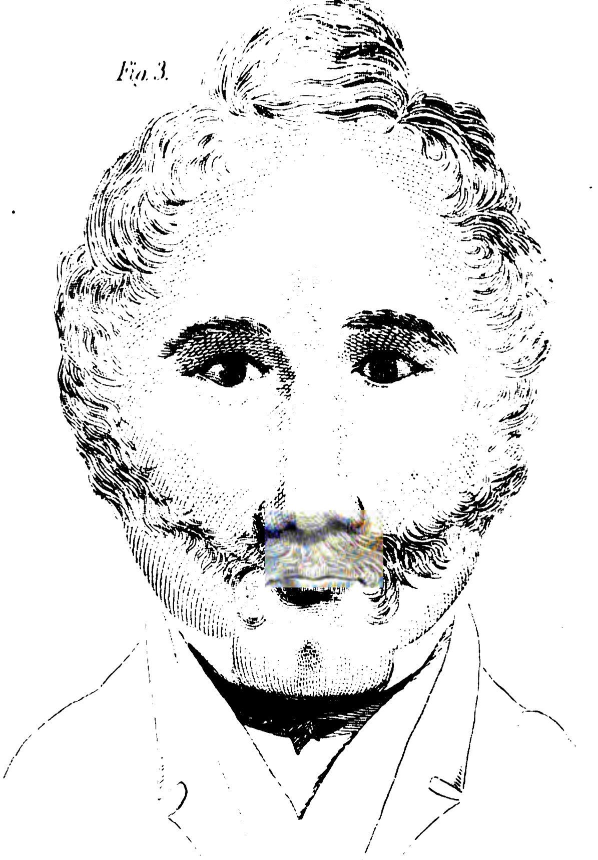

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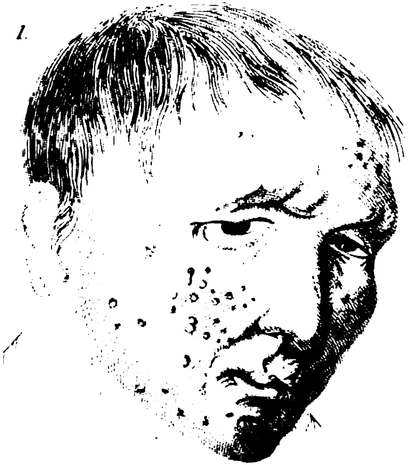

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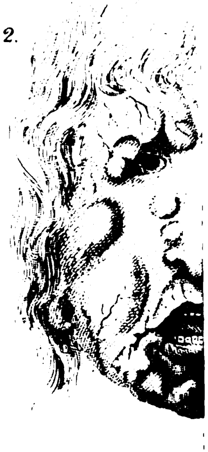

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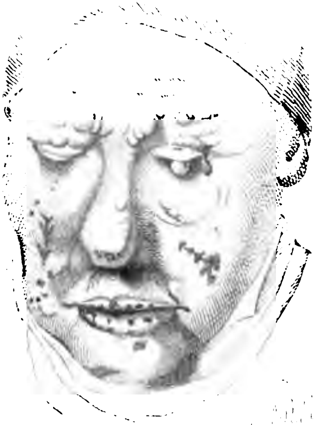

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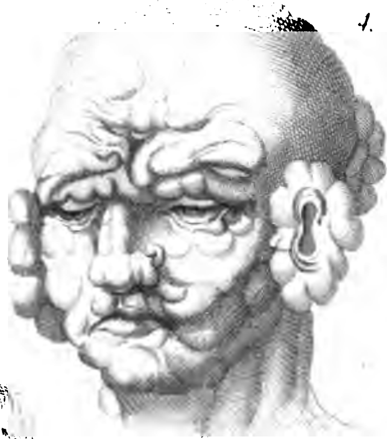

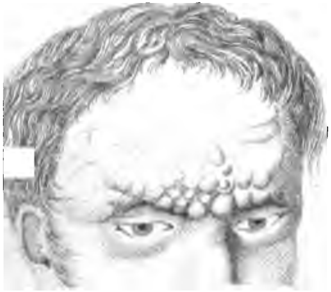

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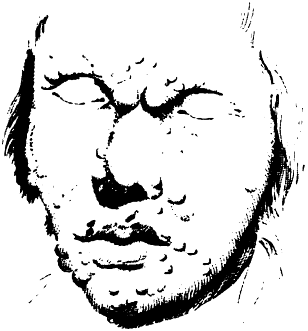

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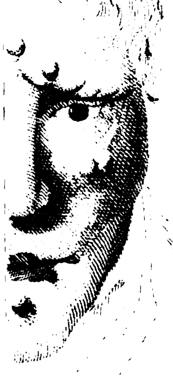

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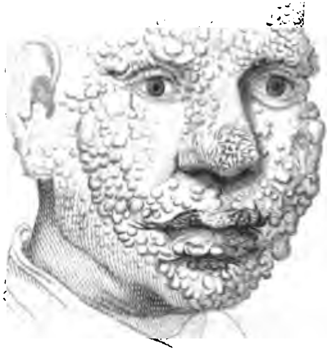

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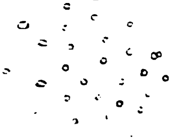

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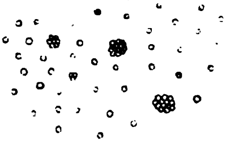

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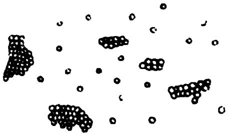

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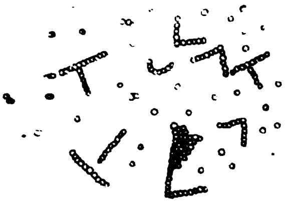

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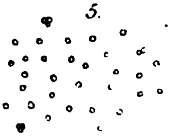

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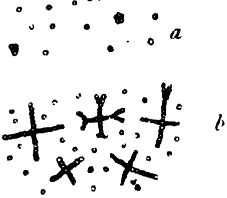

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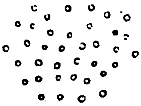

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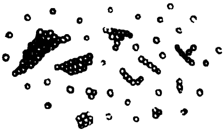

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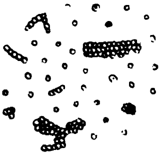

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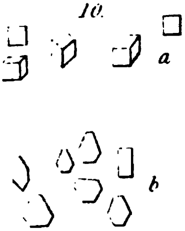

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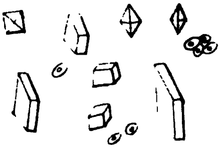

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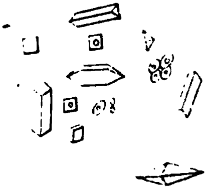

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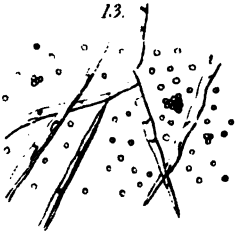

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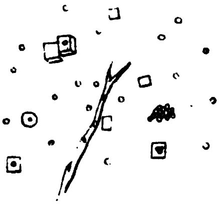

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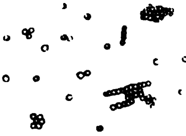

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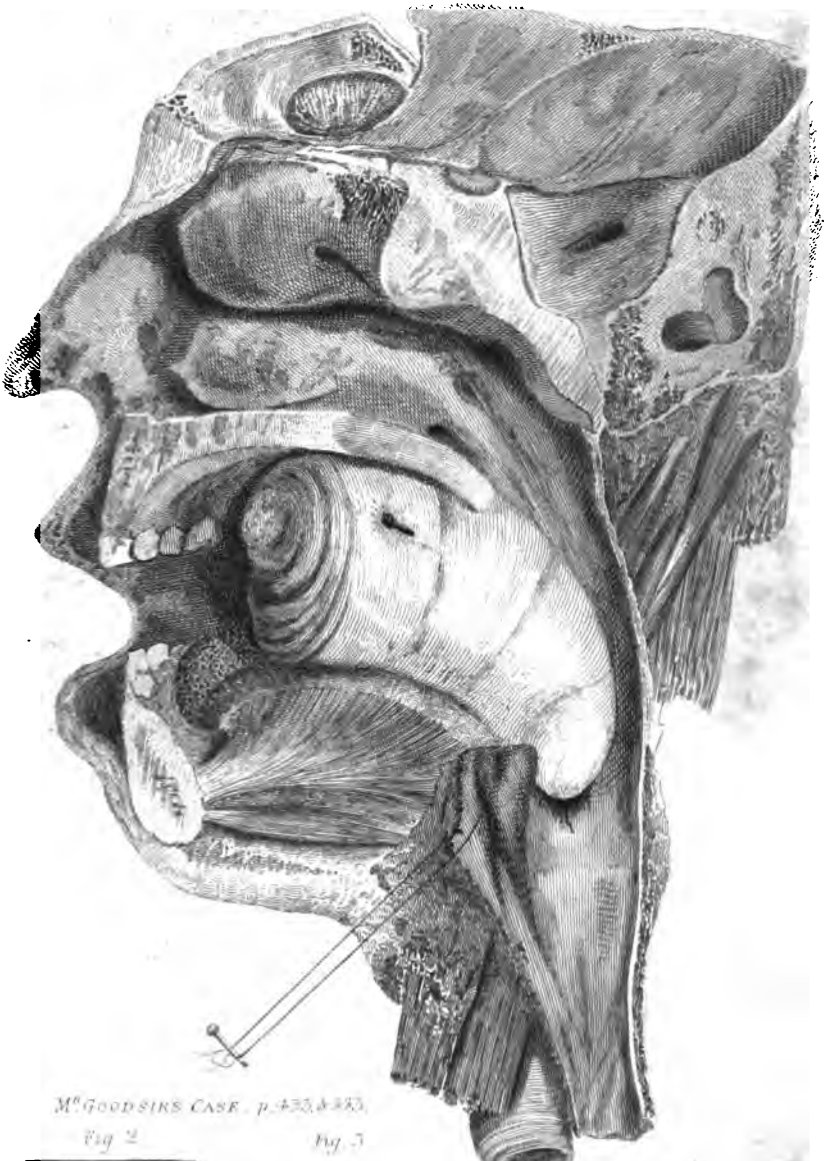

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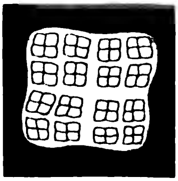

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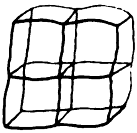

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